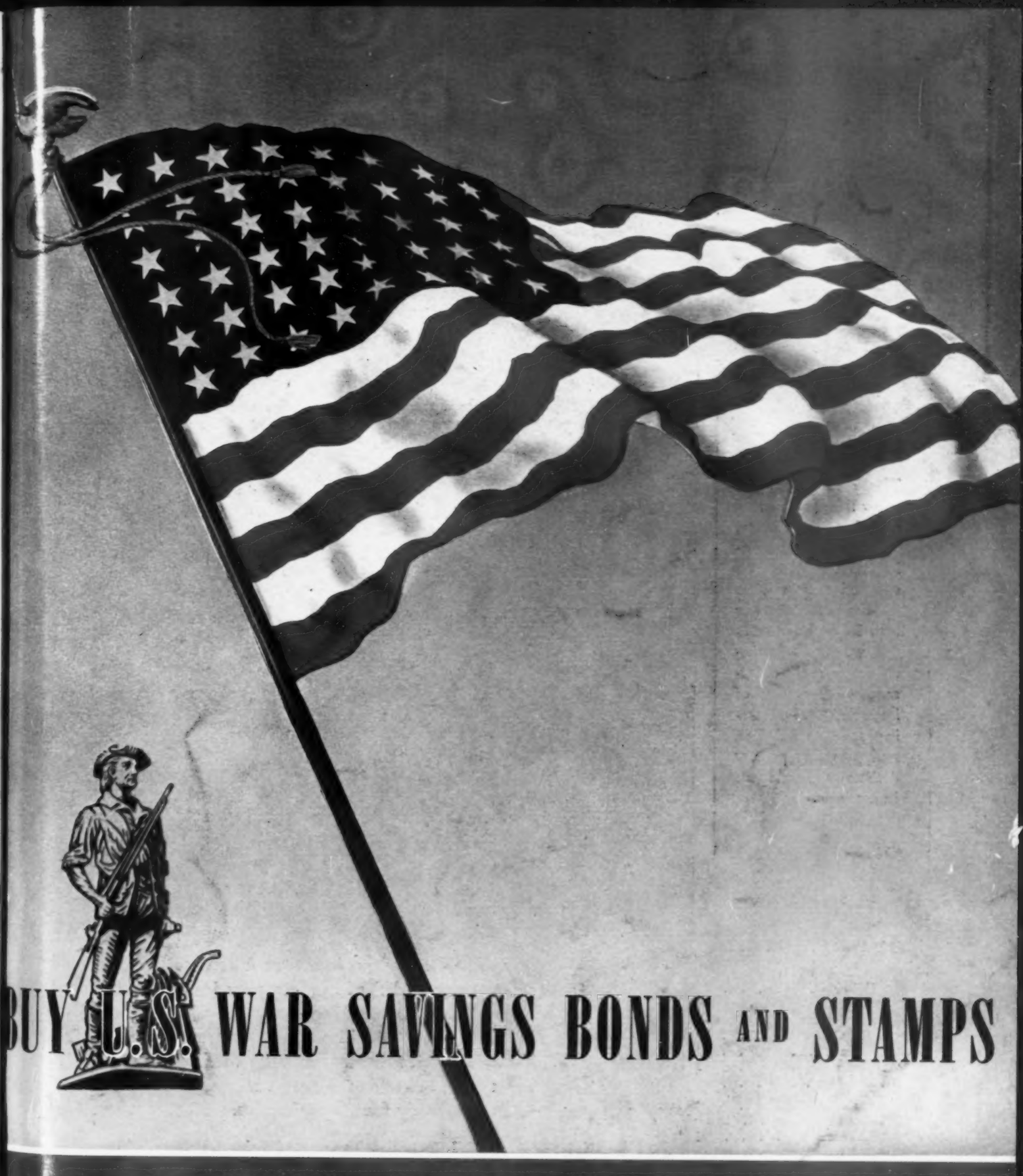


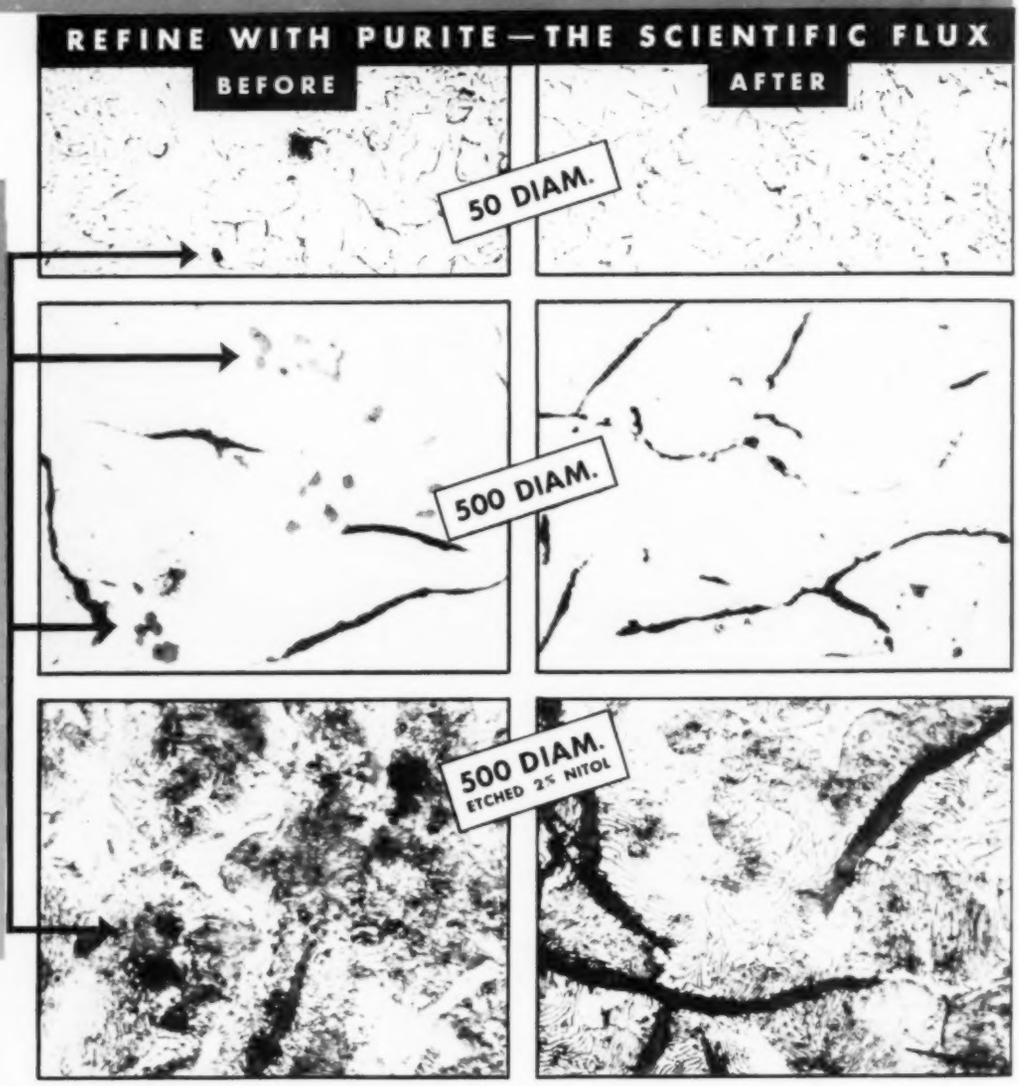
FIFTIETH YEAR

THE FOUNDRY

July 1942

This cover space released by Modrup Steel Products Company to enable The FOUNDRY to reproduce the American Flag.

WASH OUT IMPURITIES...INCREASE STRENGTH AND MACHINABILITY...IMPROVE GRAIN STRUCTURE



These micrographs show the structure of a 100% scrap mixture, before and after refining with PURITE in a covered teapot ladle —4 lbs. of PURITE per ton. Note how PURITE washes out inclusions and eliminates segregation of impurities. The refining reduces sulphur, and prevents porous defects and hard spots in castings.

ANALYSES AND TESTS

	BEFORE	AFTER
Sulphur	0.137%	0.104%
Combined Carbon	.93	.79
Graphitic Carbon	2.45	2.57
Total Carbon	3.38	3.36
Silicon	1.84	1.83
Manganese	.30	.27
Phosphorus	.53	.54
Tensile Str. Sq. In.	32020 lbs.	33750 lbs.
Brinell Number	226	220
Machinability	30*	20*

*Time in seconds required to drill through 1" test bar with ½" twist drill at 50 pounds pressure and 1700 R.P.M.

PURITE
THE SCIENTIFIC FLUX
THE MATHIESON ALKALI WORKS (INC.)
60 EAST 42ND STREET, NEW YORK, N. Y.
(Licensee of Metallurgical Development Company, Inc.)

The speed-up in national defense has increased the demand for high test gray iron and semi-steel castings that machine easily and take a high polish. That PURITE will produce a strong, clean casting with high finishing qualities from an all-scrap mixture is in itself proof of its refining value as applied to ordinary foundry mixtures.

PURITE—whether used in the cupola charge or in the new elongated teapot ladle—washes out impurities and improves the soundness and machinability of gray iron and semi-steel castings.

Let us show you how to improve your castings by refining with PURITE, The Scientific Flux. Write us today.

R v.70 pt.2 Jy-D'42

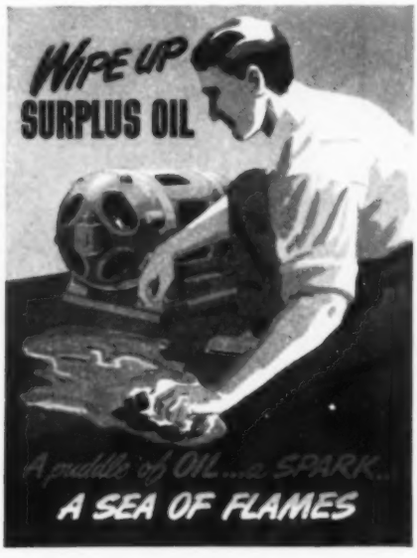
FIGHTING FIRES before they start

Most fires are preventable. A smoldering cigarette, flipped carelessly into a dark corner . . . a welder's spark flying unnoticed into a pile of oily waste—these little things can, and do, start devastating fires.

At the beginning of the war emergency, recognizing that fire is a treacherous and deadly saboteur of production, Bethlehem intensified its attack on the fire hazard. As always, trained, fully-equipped fire-fighting forces supplied the backbone of the fire-control effort, maintaining day-and-night vigilance in every Bethlehem plant and shipyard.

But to bring home the vital importance of fire prevention and control to every Bethlehem employee, we've designed a series of posters in full color and are displaying them in key locations throughout all Bethlehem shipyards and steel plants, which are now engaged in vital war work.

These posters are based on analysis of the most serious causes of fire and the all-important part of the human element in fire prevention. By pointing out to employees specific ways in which they can prevent or subdue fires, the posters are helping to minimize a potentially grave threat to the production of war materials.



Five of Bethlehem's series of fire-prevention posters. These posters are printed in full color. Each poster is designed to emphasize a specific problem in fire prevention or control.

BETHLEHEM STEEL

War-production plant executives who are carrying on fire-prevention campaigns may find these posters of interest. A complimentary set will be supplied on request to Bethlehem Steel Company, Bethlehem, Pa.

WHERE TO BUY

The Best in Supplies

NOW, more than ever before, foundries should use the best supplies they can get. Better supplies have the habit of producing better castings—faster; and no foundry can make a greater contribution to our Victory program than that.

Foundries who regularly use Federal supplies need never worry about the best. For over thirty years, one of our constant aims has been the production of better supplies for foundries.

Better supplies can only result from constant research. Recent Federal products, resulting from our research, as well as one old favorite, are listed below. It will pay you to read about them now.

NO. 867 STEEL WASH

Everything a steel wash should be! Stays in suspension—mixes with plain water because it has its own bond. No. 867 covers well, is carbon-free and can be dipped, sprayed or brushed. When applied to cores or molds, green or dry sand, it will not buckle when torched or baked.

VICTORY PARTING

A new white non-silica parting that is rapidly growing in acceptance. It has no silica content and can be used in any state. Because it's white, it is easily seen in the mold. Eliminates that "extra shake" because you see it when it's on.

FEDERAL GREEN BOND

The largest selling Wyoming bentonite in the foundry field. The reasons are simple: first, it's better and second, more foundries have proved it to their own satisfaction. Easily controlled because it's uniform. You can't buy a better bond than Federal Green Bond!

ROYAL BINDER

You can have stronger cores that will save hours in your cleaning room by replacing one-quarter to one-half of your oil with Royal Binder. Royal gives excellent green strength and saves time and money. Can be used either as a paste or binder.

THE FEDERAL FOUNDRY SUPPLY CO.

4600 East 71st Street • Cleveland, Ohio

Seacoal Plant
CHICAGO CHARLEROI, PA. CHATTANOOGA, TENN. DETROIT MILWAUKEE MINNEAPOLIS NEW YORK ST. LOUIS RICHMOND, VA. Mines
UPTON, WYO.

THE FOUNDRY

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OUR COVER

And the Star-Spangled Banner in triumph shall wave
O'er the land of the free and the home of the brave.

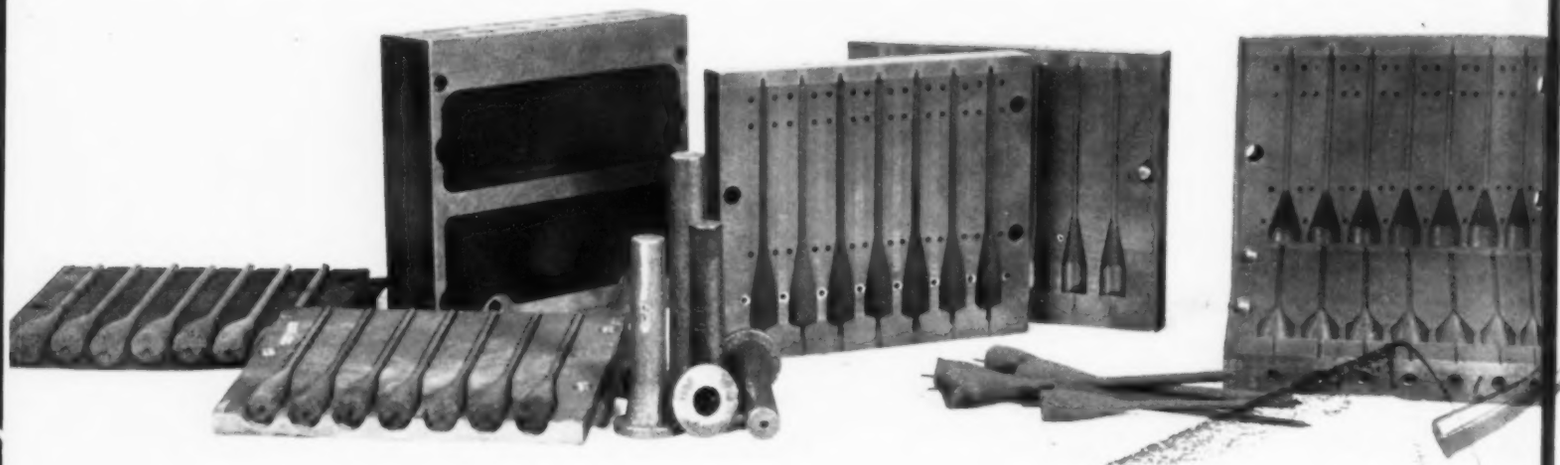
We are so proud of the front cover of this issue of THE FOUNDRY, presenting the American Flag, that we have run off a few extra copies. As long as the supply lasts, copies may be obtained by addressing the Readers' Service Department of THE FOUNDRY, Penton Building, Cleveland.

ever blow $\frac{1}{8}$-INCH

Blown cores $\frac{1}{8}$" and $\frac{3}{16}$" diameter are no trick at all for

FRANK J. BROM
MACHINE & FOUNDRY CO.
WINONA, MINN.

Does it with ⟶



THE life of a Sandblast Nozzle is a short and merry one, unless it is made of expensive alloys, and even when these alloys are obtainable many users prefer the cheaper cast iron nozzles and more of them. Anyway, the Brom brothers have worked out a way to produce them fast and cheap. The picture shows the cores, the blowing boxes and the dryers. The cores adhere firmly to the center wires but come freely from the boxes. President Brom says he tried all kinds of core oil and got absolutely the best results from Linoil. Baked 20 minutes at 400° F.

CORES?

this Sandblast Nozzle Manufacturing Specialist

LINOIL

FOUNDRYMEN who have used Linoil for years tell you Linoil has saved time in their foundries. Time in a foundry has always meant money, but never like it does in 1942. Time saved in the cleaning room (Linoil), time saved in machining castings (Linoil), time saved by decreased per-

centage of defective castings (Linoil), time saved in handling cores (Linoil), time saved in drying time (Linoil), time saved in corebench work (Linoil), and time saved by Linoil's unvarying uniformity. Use Linoil to fight waste of labor time, of material process time, of total schedule time.

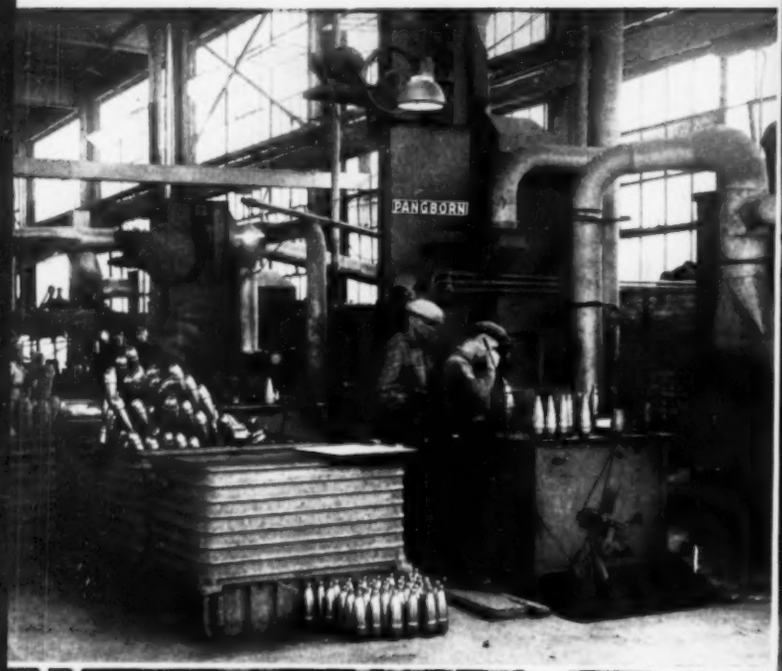
THE WERNER G. SMITH COMPANY

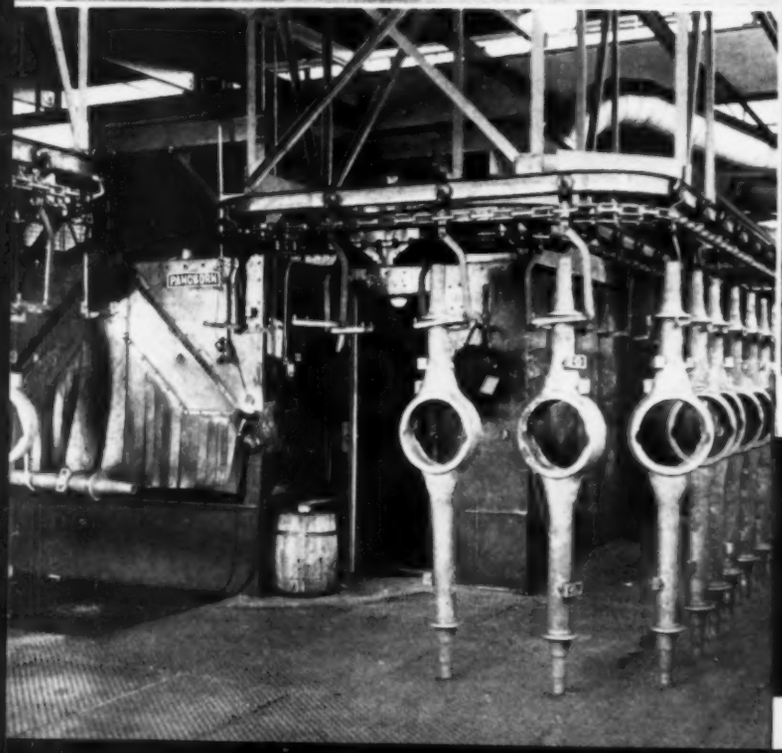
(DIVISION OF ARCHER-DANIELS-MIDLAND COMPANY)

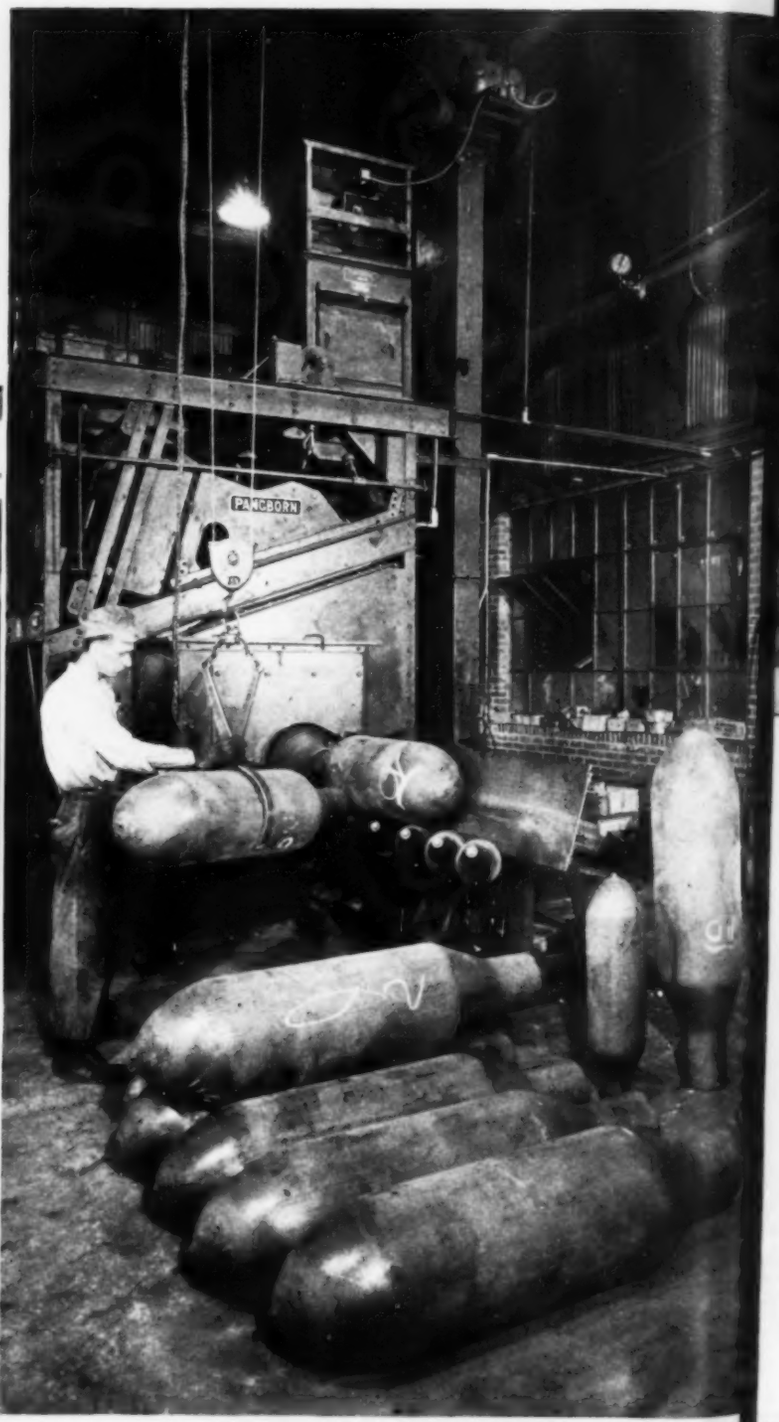
2191 West 110th Street — Cleveland, Ohio

«Die Verdammten ROTOBLASTS!»

These pictures show a few of the many reasons why HITLER hates the smooth ROTOBLAST efficiency that has increased so greatly the production of Bombs, Shells and Tank castings and parts.



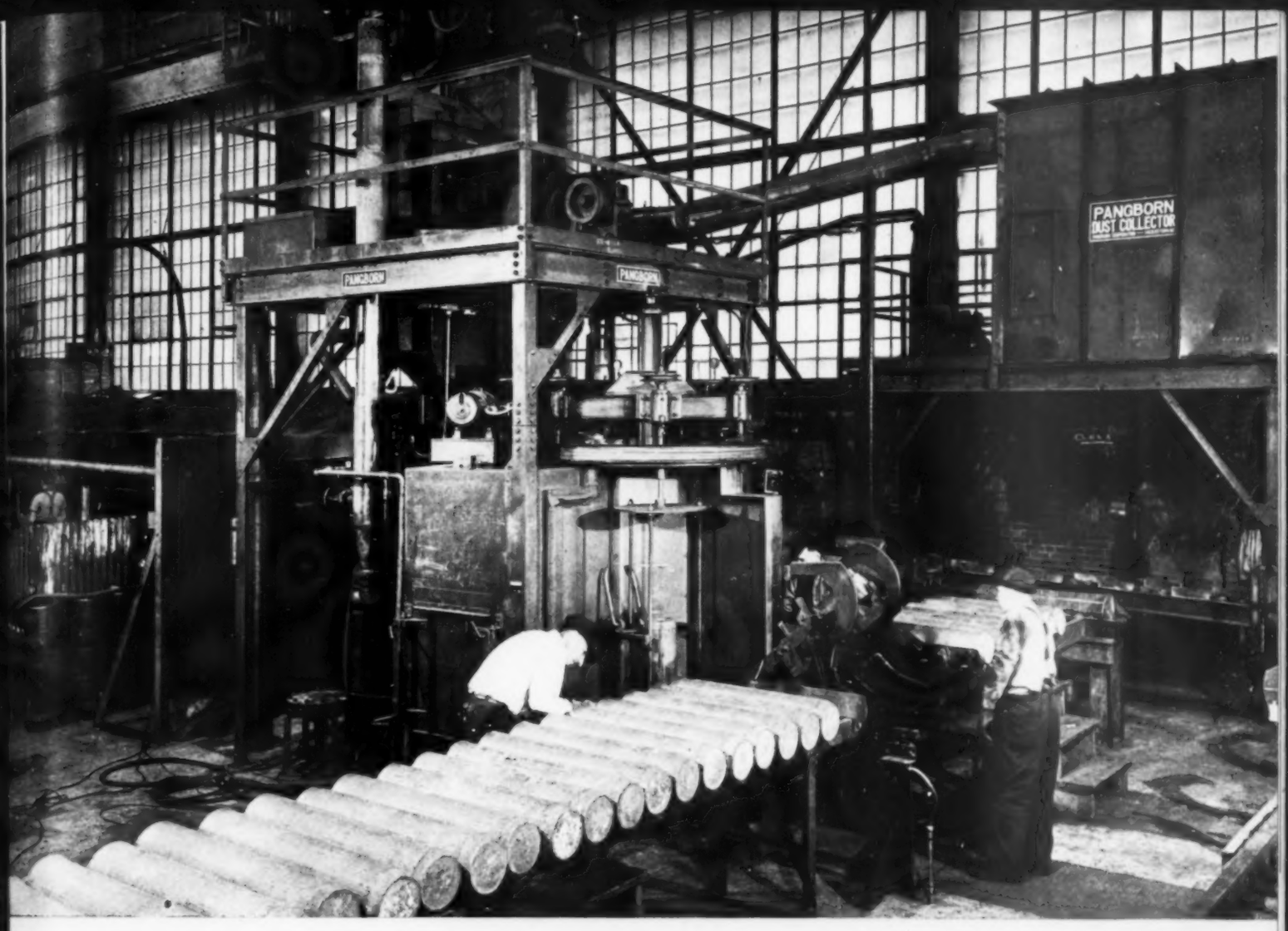




WORLD'S LARGEST MANUF URI

PAN

HAGERSTOWN -



ROTOBLAST Airless Cleaning and standard Air Blast Cleaning have helped many plants raise production schedules 80 to 400 per cent. ● Shell cleaning has been speeded--bombs are being descaled inside and out faster than ever thought possible. Armor plate--tank parts--ship parts--plane parts--motor castings for tanks, planes and trucks--all ganging up on Hitler for a decisive knock-out blow! No wonder he says "Die verdammten ROTOBLASTS"! He too, knows the ROTOBLAST is overcoming all cleaning problems *economically and well.*

URER OF BLAST CLEANING AND DUST CONTROL EQUIPMENT

NGBORN ★

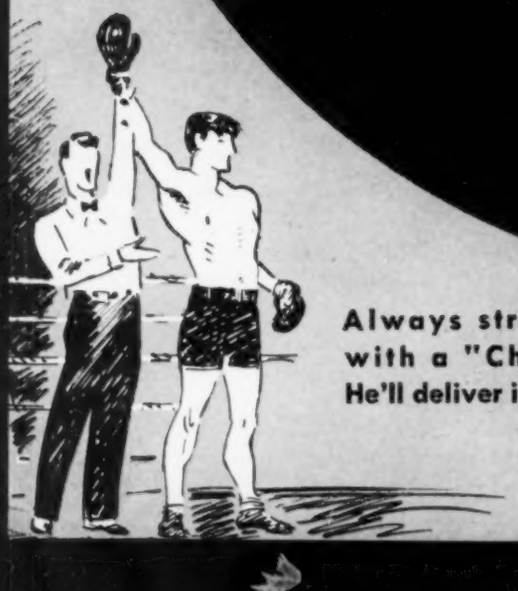
- - - - - - MARYLAND

"CHAMPIONS"

Portable Model

10" JOLT SQUEEZE PUSH-OFF

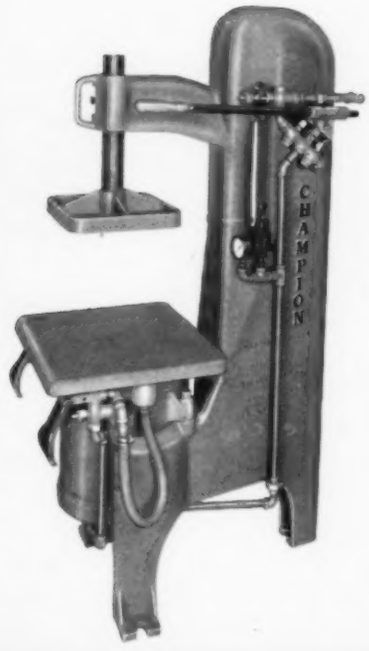
a "Champion" that defies all challengers.



Always string along with a "Champion." He'll deliver in the pinch.

CHAMPION

always mean the *BEST!*



Stationary 12" Jolt Squeezer

Portable 12" Jolt Squeezer

"Champion" *Push-Off Machines* Make Tough Jobs Easy

It's going to take a real "Champion" to win this war, and he's none other than your *Uncle Sam* . . . calling on each and every American to do his utmost to bring about an overwhelming victory and a lasting peace. ¶ Our part of the task is to make "tough jobs easy" for the foundry industry—to design and build the best obtainable production molding and core machines. ¶ Behind every "Champion" equipment stands an experience of forty-six years during which our every effort has been directed toward doing our job, to the best of human ability and ingenuity; an experience which enables us to guarantee 100% satisfaction on every "Champion" installation. No manufacturer can offer a finer guarantee . . . no "Champion" can deliver more. To get better castings and more of them; to reduce your scrap losses; to keep your men happy on the job—always depend upon a "Champion."

Foundry & Machine Co.

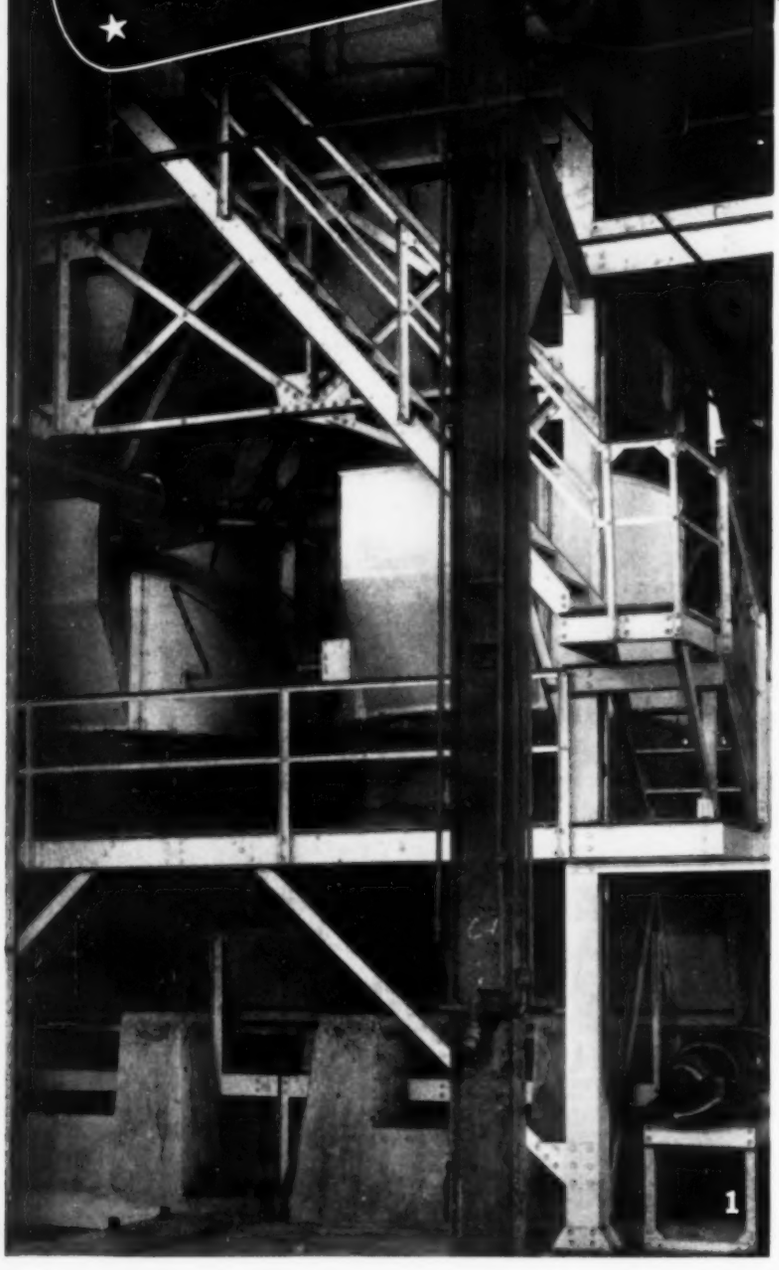
1318 West 21st Street
CHICAGO, ILLINOIS

SIMPSON INTENSIVE MIXERS

plus "NATIONAL" Designed Mechanized Installations

HELP MALLEABLE FOUNDRIES

To Improve Product Quality —Increase Production and Secure Greater Economy



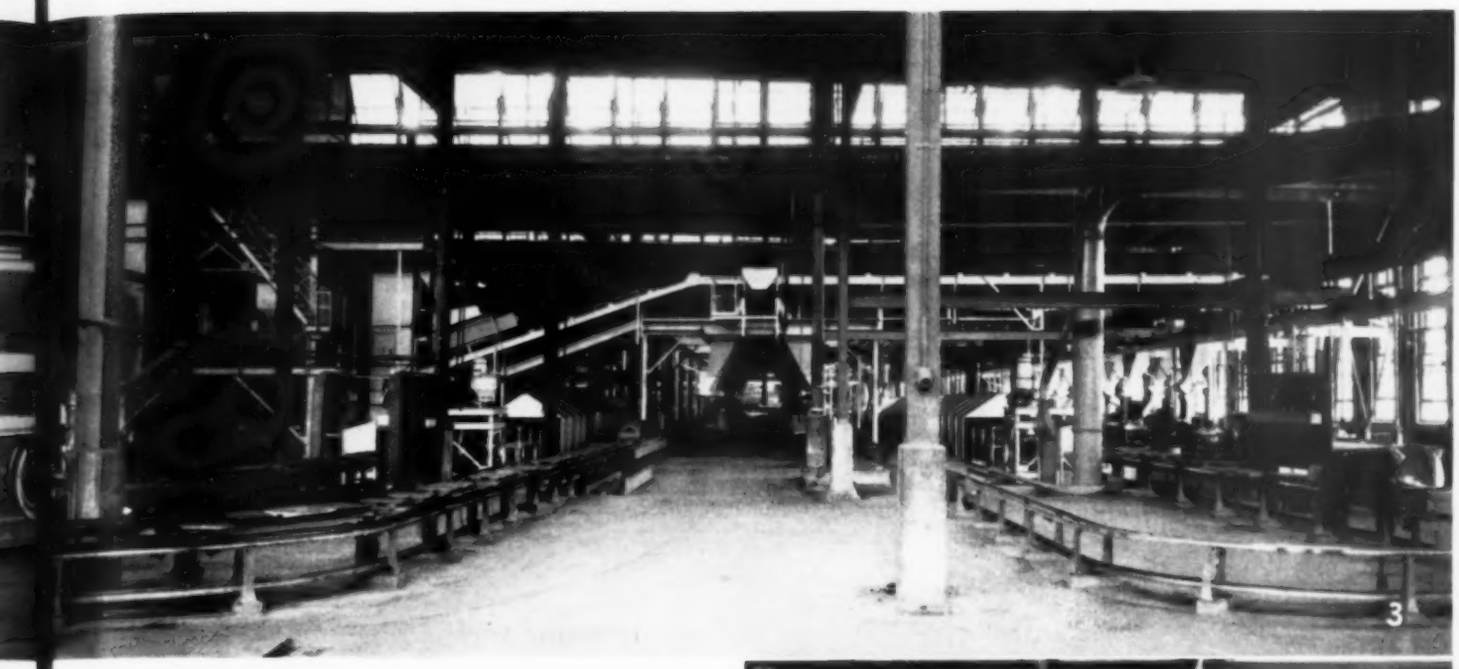
READ that "headline" again . . . it contains essential facts that should interest any foundryman confronted with today's vital war production problems. These are not idle claims . . . they are *facts*.

One example of the benefits offered through Simpson Mixers plus National installed equipment is illustrated here. These views show part of the completely mechanized Malleable Iron Fitting Co. foundry at Branford, Conn.

This foundry utilizes the National Mono-train Mold Conveyor, operating on approximately a 5 minute cycle, 87 to 88 trains per day per line. All molding and pouring is done while train is stopped, dumping is done while train is moving slowly. This method assures great flexibility, no delay for molders, no time wasted hunting for empty space to put mold, no looking for bottom boards.

Two No. 3 Hi-Duty Simpson Intensive Mixers condition all the sand—no special facings are required. No hot sand problem. Up to 40 tons of properly conditioned sand per hour per machine—using only one operator for both units, only 40 H.P. per unit. Results show lowest sand and bond costs per ton of castings, low losses, high product quality.

If you're interested in results like this, get in touch with a National foundry engineer.



1. *View showing the two No. 3 Hi-Duty Simpson Mixers installed at the Malleable Iron Fittings Co. Foundry.*

2. *Electrically driven "locomotive" which hauls the National Mono-train Mold Conveyor. 4 trains to a loop.*

3. *General view of operating floor, showing sections of Mono-train rails.*

4. *View showing aisle for core delivery to 36 molding stations.*

5. *Mono-train in pouring zone. Note jackets and weights on rack, adjacent to proper mold. Each car stops at same position each cycle.*

Further facts and figures on SIMPSON INTENSIVE MIXERS:

It costs *less* to mix 3,000 lbs. of sand in 2 minutes in the new Simpson Intensive Mixer, than to mix 1,500 lbs. of sand 1 minute in other types of mixers. Here's why:

1. Up to 40% less bonding material is required.

2. Less than ½ the kilowatt hours per ton is required.

3. If 2 machines are required in a system, one man may operate both mixers because of the longer cycle, whereas it takes one man per machine on shorter cycles.

Write for further details.

SIMPSON INTENSIVE MIXERS

NATIONAL ENGINEERING COMPANY

MACHINERY HALL BUILDING • CHICAGO, ILLINOIS

Manufacturers and Selling Agents for Continental European Countries:—The George Fischer Steel & Iron Works, Schaffhausen, Switzerland. For the British Possessions, Excluding Canada and Australia—August's Limited, Halifax, England. For Canada—Dominion Engineering Co., Ltd., Montreal, Canada. For Australia and New Zealand—Gibson, Battle & Co., Pty., Ltd. Sydney, Australia

An Announcement by

BUELL ENGINEERING COMPANY, Inc.

* * *

Buell Engineering Company, Inc. announces it is discontinuing its non-exclusive sales agency agreement with B. F. Sturtevant Company, as of August 1, 1942.

This agreement, entered into in March, 1939, authorized the B. F. Sturtevant Company to sell in their name Buell (van Tongeren) dust collectors in the continental United States and Alaska on a commission basis. Buell however has been entirely responsible for the design, construction and operation of all Buell (van Tongeren) dust collectors sold by Sturtevant.

After August 1st, 1942 all inquiries for Buell equipment and services should be directed to Buell Engineering Company, Inc., 70 Pine Street, New York City, or to the company's own established sales representatives located in principal cities as follows:

Atlanta, Ga. — MOORE-BROACH ENGINEERING CO. . . . . 412 Title Building
Buffalo, N. Y. — HENRY F. SPROULL . . . . . 319 Jackson Building
Chicago, Ill. — D. H. SKEEN & COMPANY . . . . . 1 La Salle Street
Dallas, Texas — A. M. LOCKETT & CO., LTD. . . . . 305 Magnolia Building
Detroit, Michigan — THE POE COMPANY . . . . . 2842 West Grand Blvd.
Houston, Texas — A. M. LOCKETT & CO., LTD. . . . . 1014 Electric Building
Milwaukee, Wisc. — THE DORNER COMPANY . . . . 2766 North Downer Avenue
New Orleans, La. — A. M. LOCKETT & CO., LTD. . . . . 308 Whitney Building
Philadelphia, Pa. — WM. P. MACKENZIE . . . . . 1211 Commercial Trust Building
Pittsburgh, Pa. — D. D. PENDLETON . . . . . 418 Bessemer Building
St. Louis, Mo. — B & B COMBUSTION EQUIPMENT CO. . 4030 Chouteau Avenue

buell
DUST RECOVERY SYSTEMS

BUELL ENGINEERING COMPANY, Inc. • *70 Pine Street, New York*

CRACKING BOTTLENECK No. 1

SHIPMENT IN 6 WEEKS!

Shipbuilding needs speedy DESPATCH CORE-MOLD OVENS

More ships are needed to move mountains of supplies to every quarter of the globe — to supply tons of material for our soldiers. The extreme urgency requires full cooperation all along the line.

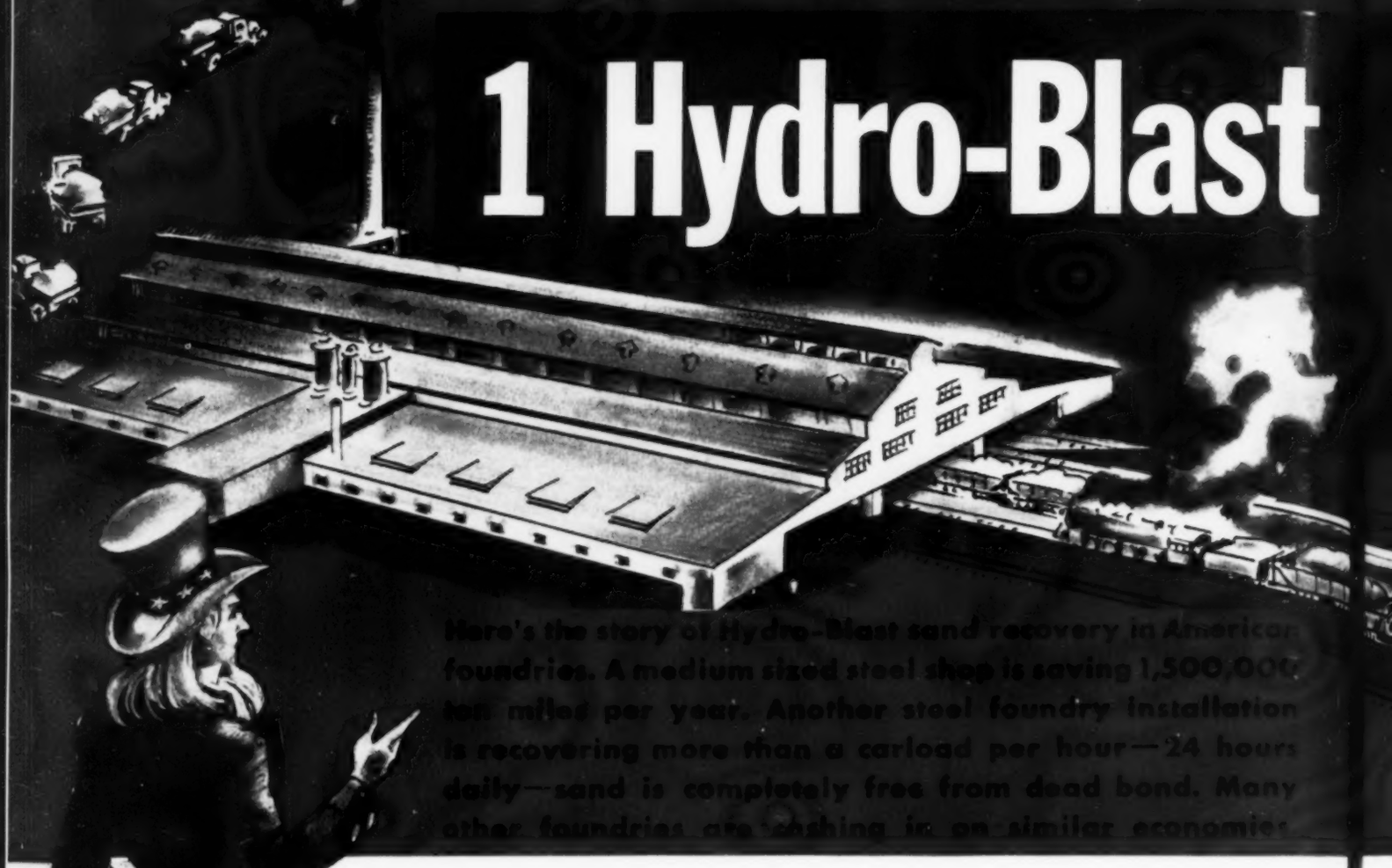
Ship parts must come faster. Foundries supplying the various castings needed must boost output enormously to meet this emergency. . . They will find Despatch Core Baking Ovens and Mold Drying Ovens will supply that important extra capacity. . . Also that Despatch Foundry Ovens can be supplied fast.

6 weeks after order, your standard Despatch Ovens will be shipped. Like all other foundries pressed for added production to speed the supply of war materials, you, too, will discover the real merit of Despatch Foundry Ovens.

Phone or Wire for a Despatch Engineer. **Despatch Oven Company, Minneapolis, Minn.**

DESPATCH
OVEN COMPANY MINNEAPOLIS

1 Hydro-Blast



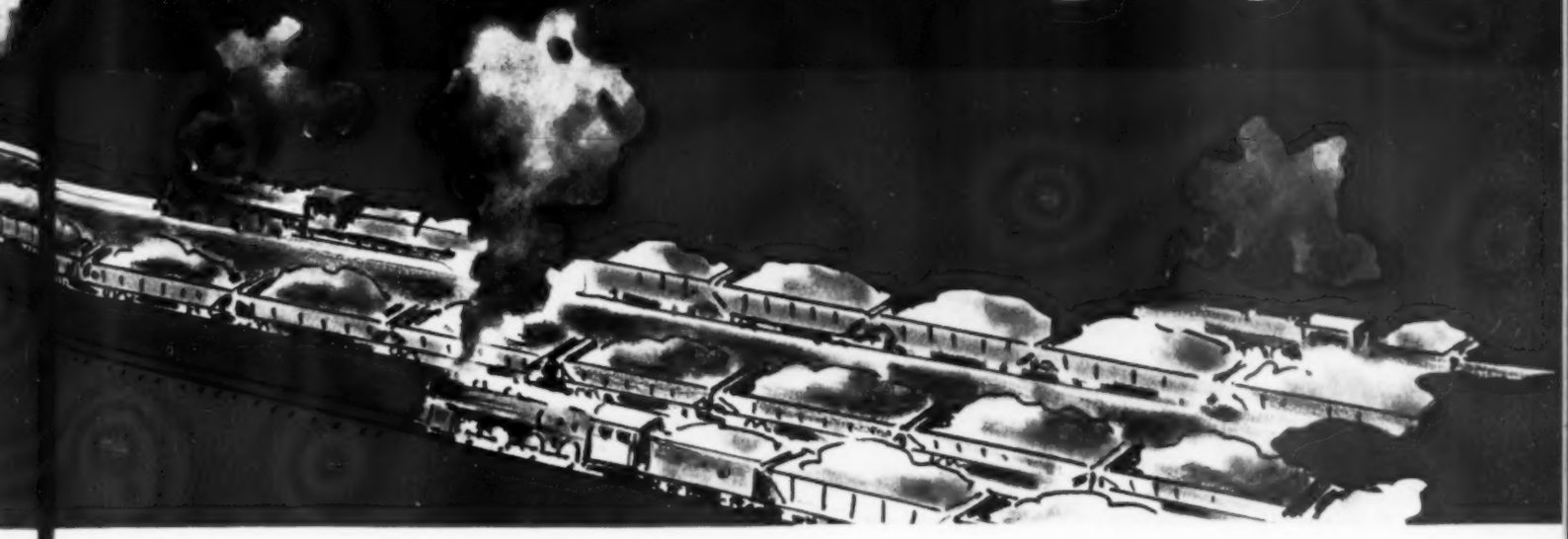
Here's the story of Hydro-Blast sand recovery in American foundries. A medium sized steel shop is saving 1,500,000 ton miles per year. Another steel foundry installation is recovering more than a carload per hour—24 hours daily—sand is completely free from dead bond. Many other foundries are reaching in on similar economies.

Uncle Sam needs those ton miles desperately because there is an acute shortage of transportation facilities, despite American railroad efficiency which has been stepped up better than 400% as compared with World War I. Hydro-Blast is doing its part to bring that efficiency up to a higher percentage. One steel foundry —not a large one—used 136 carloads of sand in 12 months, representing 1,500,000 ton miles of transport, plus trucking waste sand to the dump at a cost of $1.00 per ton for disposal. Hydro-Blast recovers 109 carloads of this sand in better than new condition—a saving of ton miles which is being used to haul other sinews of war. Another Hydro-Blast is annually recovering 82% of former waste sand.

Hydro-Blast relieves the foundry of the time and cost involved in buying new sand and transporting it from the pits. It eases the railroad burden by appreciably reducing the ton miles required to move the enormous tonnage of sand needed for the *all-out war effort* of America's foundries. It saves trucking costs where necessary to carry waste sand to the dump.

The HYDRO-BLAST C

saved 1,500,000 ton miles in a single year



Hydro-Blast systems in service today are relieving the railroads and saving American foundries in excess of 150,000,000 ton miles annually + waste sand disposal cost + better than new sand for reuse. Such economies are incidental to Hydro-Blast's basic function which is to clean castings better and cheaper than they have ever been cleaned before. Hydro-Blasted castings require less machining because freedom from imbedded sand particles greatly extends the service life of machine tools. The six functions performed by this modern method make it indispensable to the war effort and to the future when competition will force every foundry to comb costs for every potential saving.

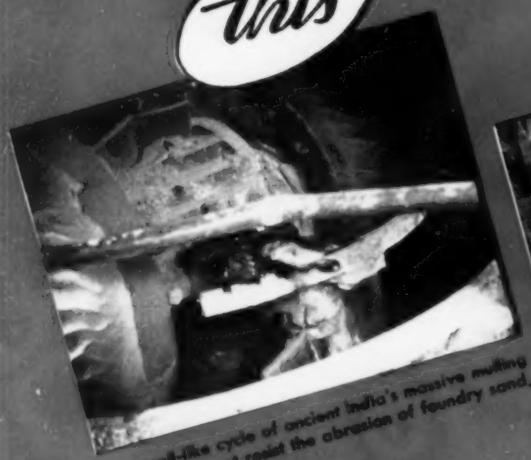
Hydro-Blast economies are evidenced in cleaner castings; cleaner foundries; more accurate sand control; recovery of sand; improved condition of sand; and ample sand supply at your foundry door, scrubbed and dried to any desired moisture content—ready for reuse at a fraction of its replacement cost. Steel, gray iron, malleable and non-ferrous foundries are invited to inquire about Hydro-Blast.

HOW CAN ANY FOUNDRY AFFORD NOT TO OWN A *Hydro-Blast?*

T Corporation 3118 Clybourn Ave., Chicago

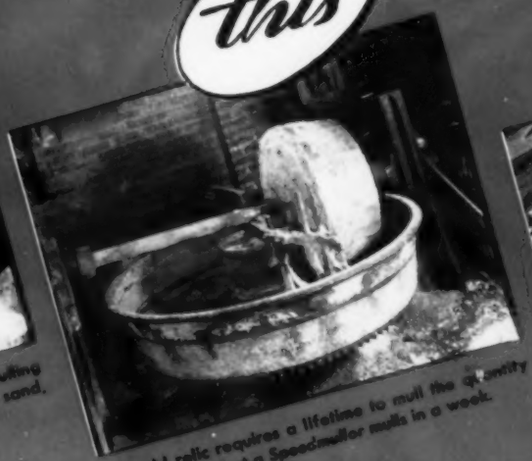
SO YOU ARE GOING TO BUY A SAND MIXER

this



The snail-like cycle of ancient India's massive mulling elements cannot resist the abrasion of foundry sand.

this

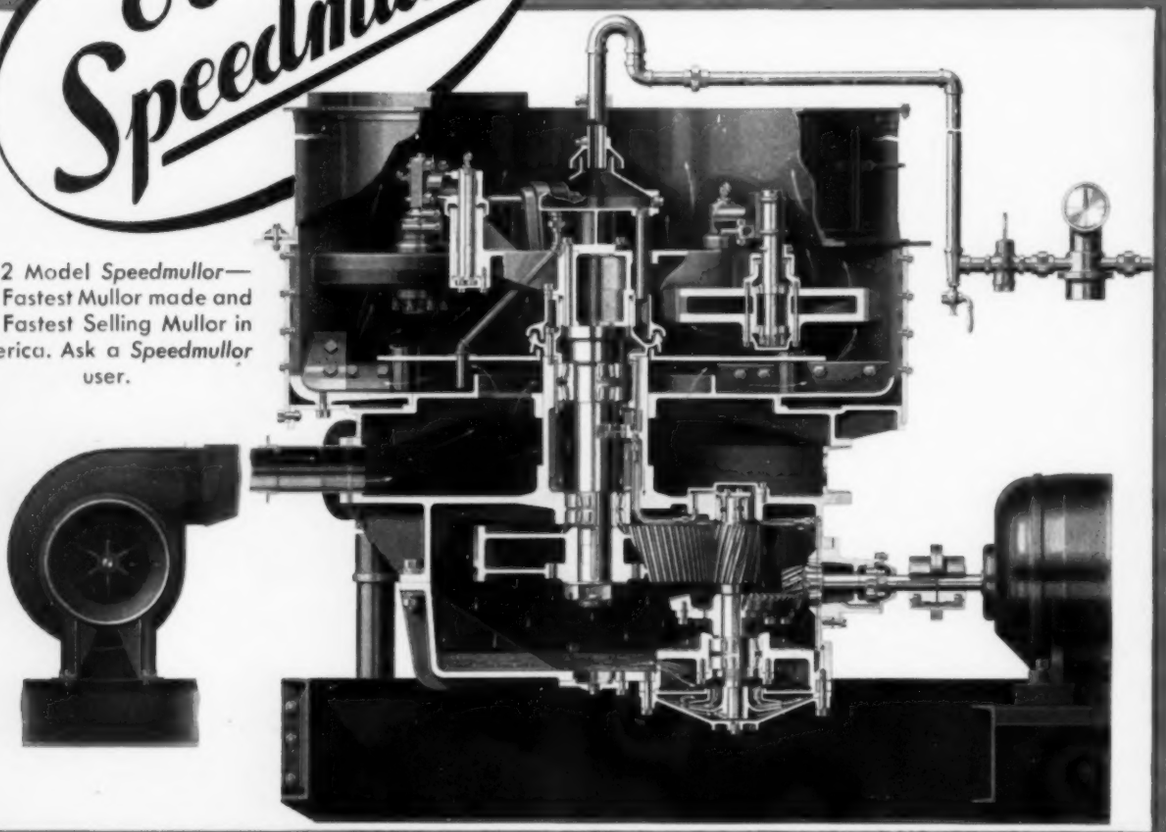


This old relic requires a lifetime to mull the quantity of sand that a Speedmullor mulls in a week.

this

The unevenly worn surfaces of the heavy steel mulling elements in this conventional type mill tell their own story.

or a Speedmullor



1942 Model *Speedmullor*—The Fastest Mullor made and the Fastest Selling Mullor in America. Ask a *Speedmullor* user.

SPEEDMULLOR'S exclusive features include 1½ minute mulling cycle to remove fines, mull and cool sand from the highest temperatures to 5 degrees above room temperature eliminating sand sticking to pattern. More accurate sand control. Economy of oils and binders. Less floor space. More flowable and more rammable sand. Greatest bonded strength and workability from less binder and moisture and 4½ times faster than any mill that has ever been offered to the foundry industry.

THE BEARDSLEY & PIPER COMPANY 2

SPEEDMULLORS Are the Fastest Selling Mullors in America!

These Repeat Orders Are the Best Endorsement of *Speedmullor* Superiority

Customer	No. of Speedmullors
Bonney Floyd Co.	2
Campbell, Wyant & Cannon	5
Fairbanks-Morse Co.	2
Ford Motor Company	17
Ohio Steel Foundry Co.	9
U. S. Aluminum Co.	4
Wehr Steel Co.	3
Blaw Knox	3
Wright Aeronautical	5
Western Foundry Co.	4
Locomotive Fin. Matl.	2
American Manganese Steel Co., Div. Am. Brake Shoe	3
American Magnesium Corp.	7
Fremont Foundry Co.	2
Zenith Foundry Co.	2
General Steel Co.	9
American Steel Foundries	10
Sperry Gyroscope Co.	4
Penn Steel Castings Co.	3
Westinghouse Air Brake Co.	3
Saginaw Mall. Iron	3
Symington Gould Corp.	3
Brown & Sharpe Mfg. Co.	2
Landis Tool	2

Partial List of Speedmullor Customers

Includes small foundries with one ***Speedmullor*** and a foundry with seventeen. June 1, 1941, there were more than 200 ***Speedmullors*** in service. Today, June 1, 1942, there is a total of 425.

	No. of Speedmullors
American Manganese Steel Div. of Am. Brake Shoe	2
American Brake Shoe & Fdy. Co., Mahwah, N. Y.	1
American Magnesium Corporation	7
Allis Chalmers Mfg. Co., Milwaukee, Wisc.	1
American Rolling Mill Co., Middletown, Ohio	1
American Steel Foundries, East Chicago, Ind.	9
American Steel Foundries, Granite City, Ill.	1
Atlas Foundry Co., Irvington, N. J.	1
Atlas Foundry Co., Detroit, Michigan	1
Acme Shear Co., Bridgeport, Conn.	1
Acme Foundry Co., Detroit, Michigan	1
Advance Foundry Co., Dayton, Ohio	1
American Steel Castings Co., Newark, N. J.	1
American Hoist & Derrick Co., St. Paul, Minn.	1
American Locomotive Co., Schenectady, N. Y.	1
American Crucible, Loraine, Ohio	1
Berkley Mach. & Fdry. Co., Norfolk, Va.	1
Brown & Sharpe Mfg. Co., Providence, R. I.	2
Blaw-Know Co., Pittsburgh, Pa.	3
Bowler Fdy. Co., Cleveland, Ohio	1
Benton Harbor Malleable, Benton Harbor, Mich.	1
Bullard Co., Bridgeport, Conn.	1
Bonney Floyd Co., Columbus, Ohio	2
Buckeye Steel Castings Co., So. Columbus, O.	1
Bardes, (E. H.) Rge. & Fdy. Co., Cincinnati, O.	1
Belle City Mall. Iron Co., Racine, Wis.	1
The Cooper Bessemer Corp., Mount Vernon, O.	1
Campbell Wyant & Cannon, Muskegon, Mich.	5
Continental Roll & Steel Fdry., East Chgo., Ind.	2
Crane Technical High School, Chicago, Ill.	1
The Connecticut Fdy. Co., Rocky Hill, Conn.	1
Crawford & Doherty Fdy. Co., Portland, Ore.	1
Chambers & Bering Quinlan Co., Decatur, Ill.	1
Central Iron Foundry Co., Detroit, Michigan	1
Carondelet Fdy., St. Louis, Mo.	1
J. I. Case Co., Racine, Wis.	1
Caterpillar Tractor Co., Peoria, Ill.	1
Continental Roll & Steel Fdy., Wheeling, W. Va.	1
Detroit Steel Castings Co., Detroit, Michigan	1
Dominion Fdries. & Steel Ltd., Hamilton, Ontario, Canada	1
Du Pont de Nemours & Co., Wilmington, Del.	1
Dodge Steel Co., Tacony, Philadelphia, Pa.	1
Draper Corp., Hopedale, Mass.	1
John Deere Tractor Co., Waterloo, Iowa	1
Electrocast Steel Fdy. Co., Chicago, Ill.	1
Elyria Foundry Co., Elyria, Ohio	1
Enot Foundry Co., Wayne, Michigan	1
Fahralloy Canada, Ltd., Orillia, Ontario, Can.	1
Florida Mach. & Fdy. Co., Jacksonville, Fla.	1
Forest Hill Fdy. Co., Newark, N. Y.	1
Frederick Iron & Steel, Frederick, Md.	1
Fletcher Works, Philadelphia, Pa.	1
Fremont Foundry Co., Fremont, Ohio	2
Fairbanks-Morse Co., Beloit, Wis.	2
Frank Foundries Corp., Moline, Ill.	1
Frick Co., Waynesboro, Penn.	1
Ford Motor Co., Detroit, Michigan	17
General Steel Co., Madison, Ill.	8
General Steel Castings Corp., Granite City, Ill.	1
General Chemical Co., Pulaski, Va.	1
Gallmeyer & Livingston, Grand Rapids, Mich.	1
General Machy. Corp., Hamilton, Ohio	1
Goslin-Birmingham Mfg. Co., Birmingham, Ala.	1
General Mall. Corp., Waukesha, Wis.	1
General Metals Corp., Oakland, Calif.	2
Hamilton Fdy. & Mach. Co., Hamilton, Ohio	1
Howard Foundry Co., Chicago, Ill.	1
International Nickel Co., Bayonne, N. J.	1
International Harvester, Indianapolis, Ind.	4
Joshua Hendy Iron Wks., Sunnyvale, Calif.	1
Kensington Steel Co., Chicago, Illinois	1
Landis Tool Co., Waynesboro, Pa.	2
James Leffel Co., Springfield, Ohio	1
Liberty Fdy. Inc., Wauwatosa, Wis.	1
Locomotive Fin. Matl., Atchison, Kan.	2
Ludlow Valve Mfg. Co., Troy, N. Y.	1
Lunkenheimer Co., Cincinnati, Ohio	1
Link Belt Co., Chicago, Ill.	1
Mt. Vernon Carr & Mfg. Co., Mount Vernon, Ill.	1
Michigan Steel Castings Co., Detroit, Michigan	1
Monroe Steel Castings Co., Monroe, Michigan	1
McWane C. I. Pipe Co., Birmingham, Ala.	1
Motor Castings Co., Milwaukee, Wis.	1
Mesta Machine Co., Homestead, Pa.	1
Milwaukee Steel Fdy. Co., Milwaukee, Wis.	1
Nordberg Mfg Co., Milwaukee, Wis.	1
N. J. Silica Sand Co., Milville, N. J.	2
National Supply Co., Torrence, Calif.	1
Norfolk & Western Rwy. Co., Roanoke, Va.	1
National Mall. & Steel Castings Co., Sharon, Pa.	1
National Motor Castings, S. Haven, Michigan	1
National Roll & Fdy., Avonmore, Pa.	1
Olympic Steel Works, Seattle, Wash.	1
Ohio Steel Foundry Co., Springfield, Ohio	2
Ohio Steel Foundry Co., Lima, Ohio	7
Pacific Car & Fdy. Co., Renton, Wash.	3
Penn Steel Castings Co., Chester, Penn.	2
The Permold Co., Medina, Ohio	1
Pacific Steel Castings Co., Berkeley, Calif.	1
Pierce Butler Radiator Corp., Syracuse, N. Y.	1
Price-Pfister Brass Mfg. Co., Los Angeles, Cal.	1
Prescott Co., Menominee, Michigan	1
Pontiac Motor Div., Pontiac, Michigan	1
Geo. F. Pettinos, Inc., Millville, N. J.	1
Pacific States Cast Iron Pipe Co., Proro, Ut.	1
Rensselaer Valve Co., Troy, N. Y.	1
The Reliable Fdy. Co., Dayton, Ohio	1
Roxbury Steel Castings Co., Hartford & Boston	3
Sperry Gyroscope Co., Brooklyn, N. Y.	2
Sperry Gyroscope Co., Lake Success, L. I., N. Y.	2
Symington Gould Corp., Rochester, N. Y.	3
Shofner Iron & Steel Wks., Portland, Ore.	1
Stuart Foundry Co., Detroit, Michigan	1
Santa Fe Foundry Co., Richmond, Calif.	1
Smith Steel Co., Milwaukee, Wis.	1
Saginaw Foundries Co., Saginaw, Mich.	1
Saginaw Mall. Iron, Saginaw, Michigan	3
St. Marys Fdy. Co., St. Marys, Ohio	1
Standard Foundry Co., Worcester, Mass.	1
Singer Mfg. Co., Elizabeth, N. J.	1
Thomas Foundries, Inc., Birmingham, Ala.	1
Taylor-Wharton Iron & Steel, High Bridge, N. J.	1
Texas Elec. Steel Castings Co., Houston, Texas	1
U. S. Aluminum Co., Bridgeport, Conn.	4
United Engr. & Fdy. Co., Canton, Ohio	1
Western Foundry Co., Morris, Ill.	1
Western Foundry Co., Chicago, Ill.	3
Westinghouse Air Brake Co., Wilmerding, Pa.	3
Wehr Steel Co., Milwaukee, Wis.	3
Westinghouse Elec. & Mfg. Co., Trafford, Pa.	1
Wisconsin Gray Iron Foundry Co., Milwaukee, Wis.	1
Wright Aeronautical Corp., Fair Lawn, N. J.	2
Wright Aeronautical Corp., Patterson, N. J.	1
Wright Aeronautical Corp., Vaughan, Ohio	2
Zenith Foundry Co., West Allis, Wis.	2

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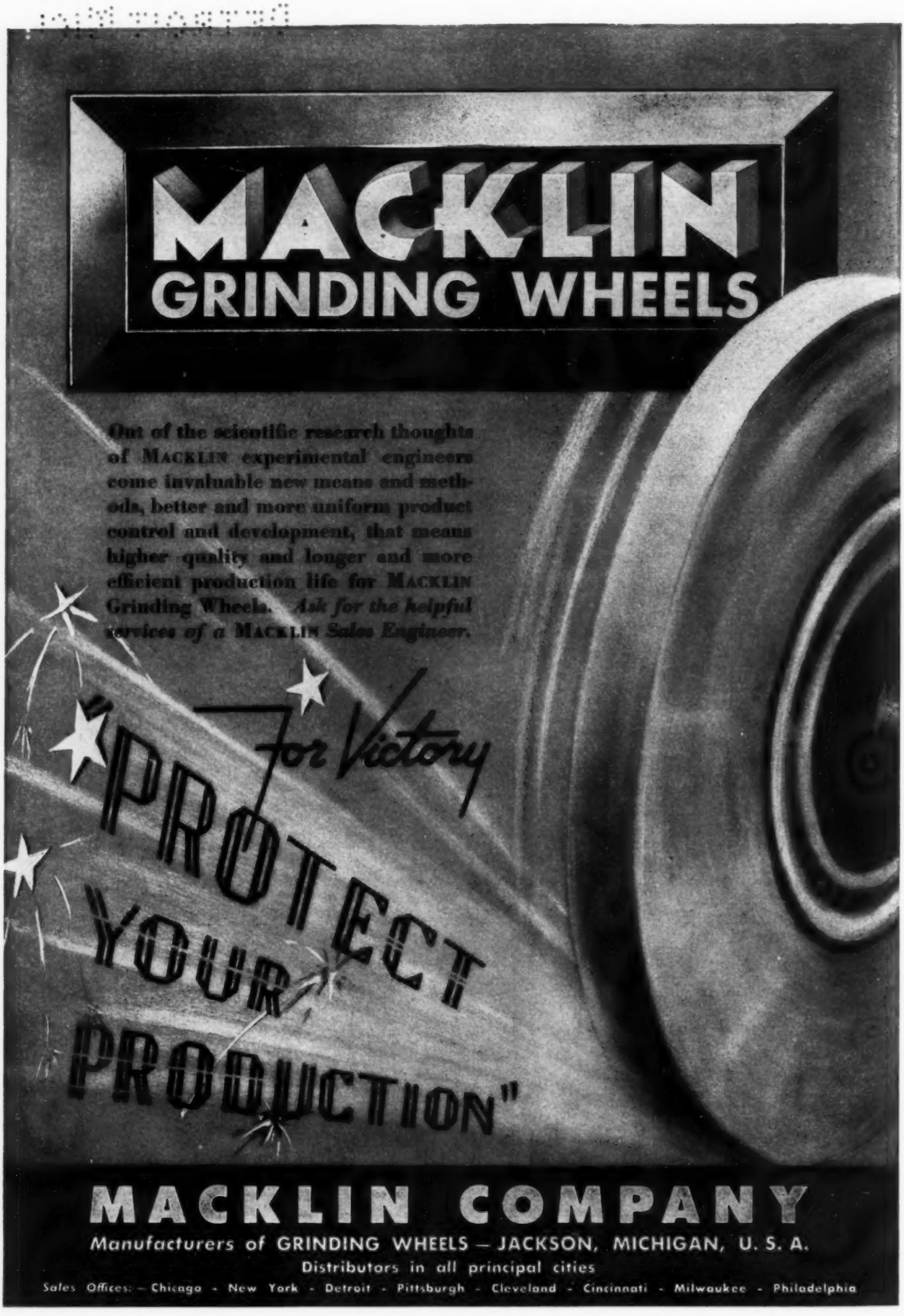
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GRINDING WHEELS
Out of the scientific research thoughts of MACKLIN experimental engineers come invaluable new means and methods, better and more uniform product control and development, that means higher quality and longer and more efficient production life for MACKLIN Grinding Wheels. Ask for the helpful services of a MACKLIN Sales Engineer.
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Manufacturers of GRINDING WHEELS — JACKSON, MICHIGAN, U. S. A.
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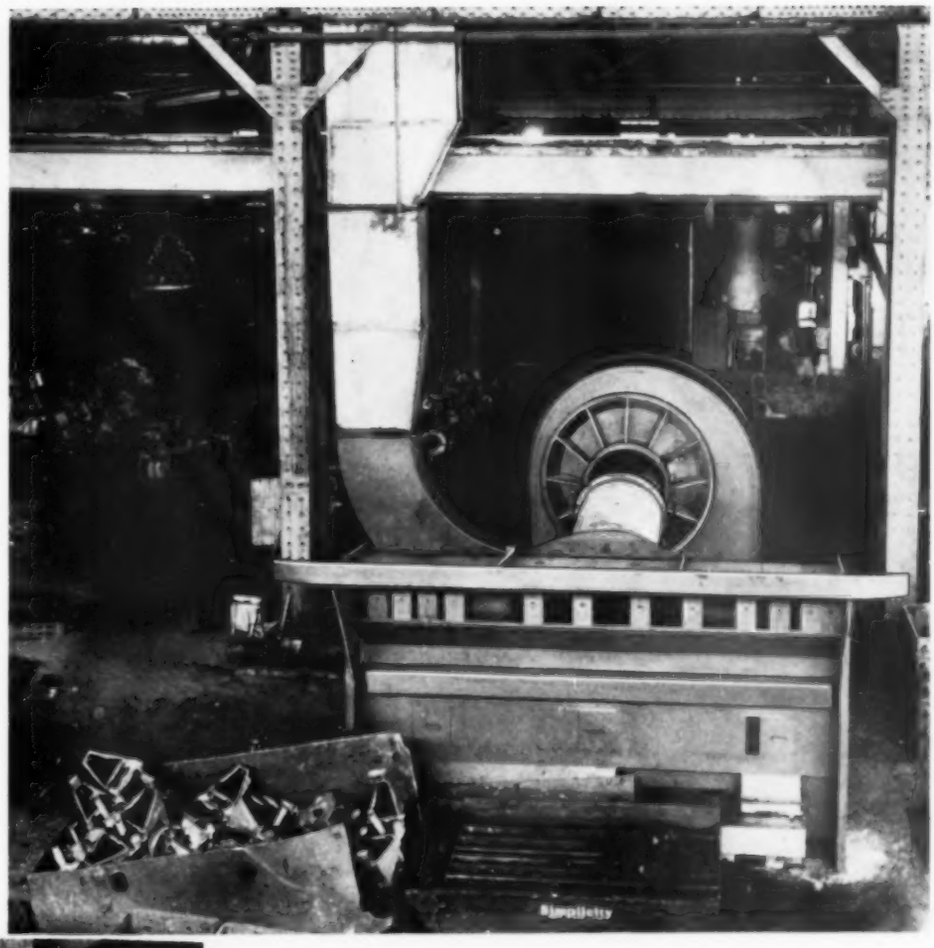
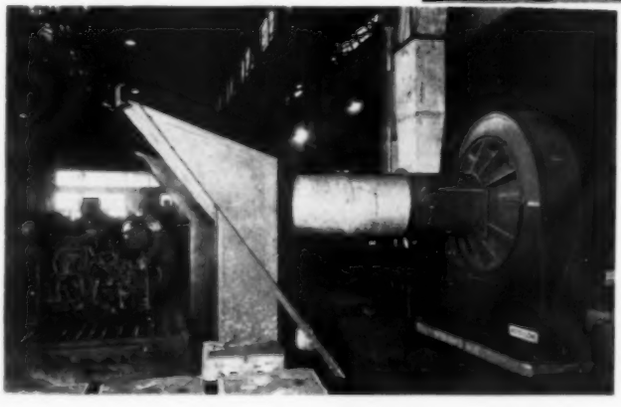
The SOLUTION to LARGE SHAKEOUT *Dust Problems*

● These close-up views of a Type W Roto-Clone installation at a large steel foundry shake out clearly illustrate the advantages which Roto-Clone "packaged" dust control offers. Notice its compactness, and location in otherwise unused space. This unit, designated Arrangement A, requires no Precleaner, and the collected dust is sluiced to a catch basin under the floor from which the water is drained off.

Complete information on the Roto-Clone and its application to all foundry dust problems is available on request. There's no obligation of course. Write us.





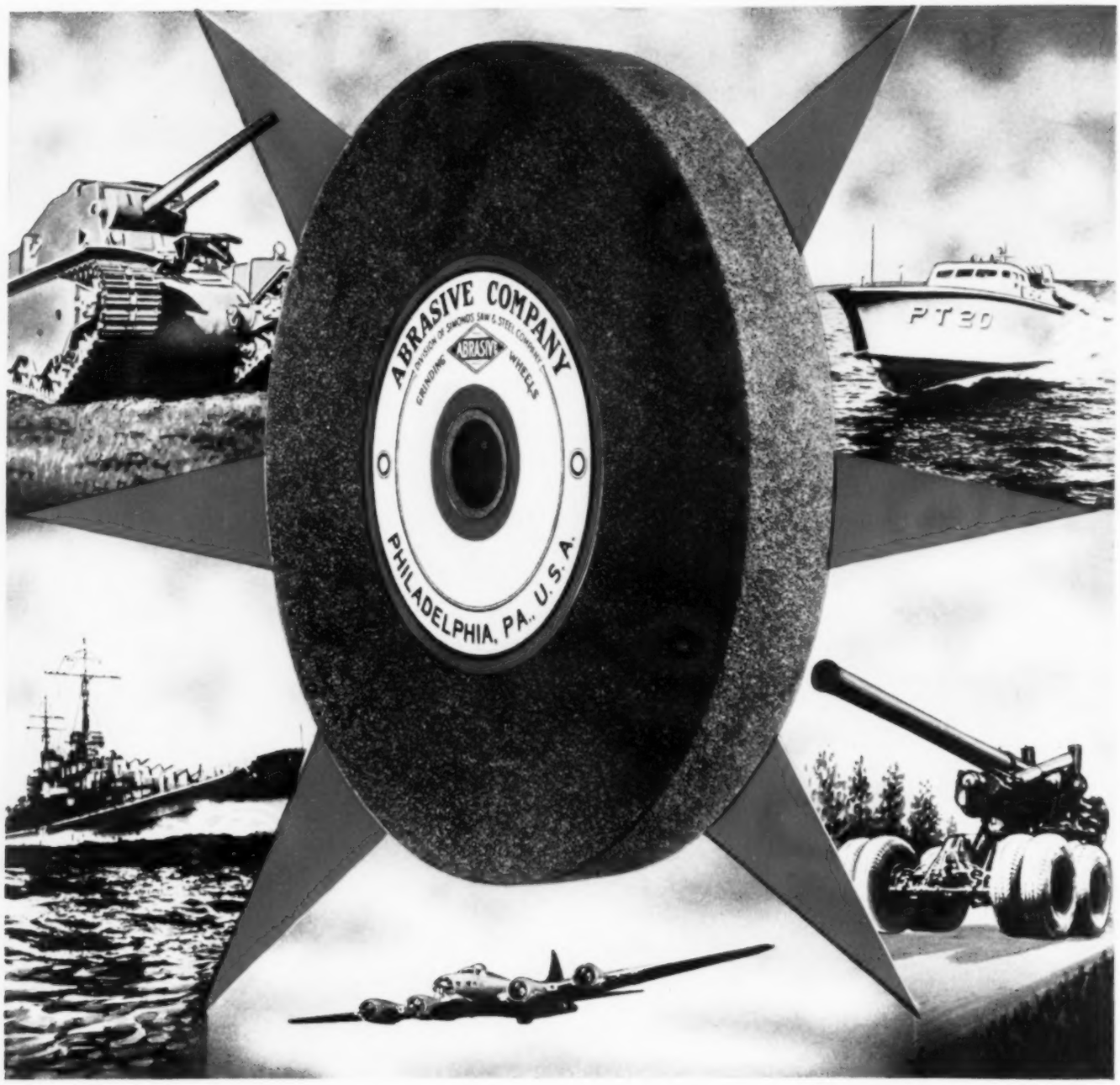
ROTO-CLONE

FOUNDRY DUST CONTROL

AMERICAN AIR FILTERS

AMERICAN AIR FILTER COMPANY, INC., 266 CENTRAL AVE, LOUISVILLE, KY.
INCORPORATED

IN CANADA, DARLING BROTHERS, LIMITED, MONTREAL, P. Q.



Production speeds Victory! Speed production with

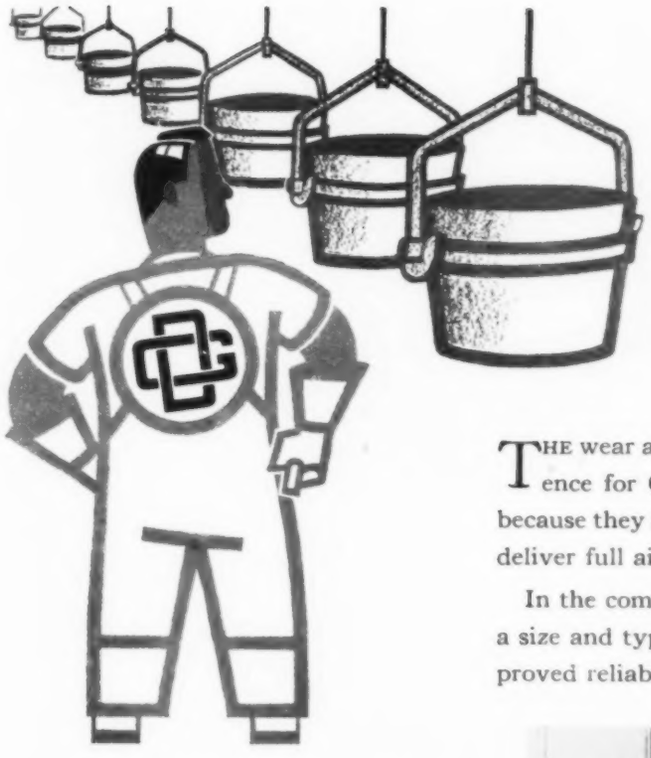
ABRASIVE COMPANY GRINDING WHEELS

1892 FIFTY YEARS OF SERVICE TO INDUSTRY 1942

ABRASIVE COMPANY

DIVISION OF SIMONDS SAW AND STEEL CO.

TACONY & FRALEY STS., PHILADELPHIA, PA. • DISTRIBUTORS IN ALL PRINCIPAL CITIES



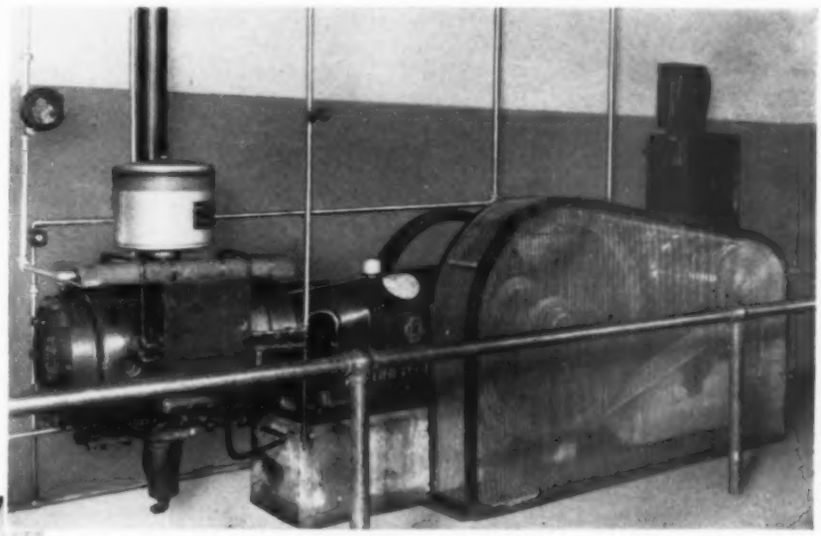
NO "Time Out" IN TIMES LIKE THESE!

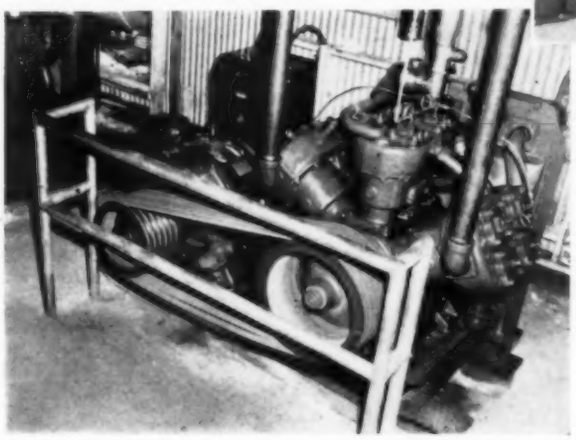
THE wear and tear of today's all-out operation is an everyday experience for Gardner-Denver Compressors. They need no "time out" because they are built for 24-hour-a-day operation, and they consistently deliver full air output every working shift.

In the complete line of Gardner-Denver Air Compressors, you'll find a size and type to fit every foundry need. Here are two compressors of proved reliability:

GARDNER-DENVER "RX" SINGLE-STAGE HORIZONTAL AIR COMPRESSORS

1. Horsepower requirements are unusually low.
2. Rugged, dirt-free construction assures long service.
3. Liberal, unrestricted valves and port areas step up efficiency.
4. Air output is automatically regulated to fit air needs.
5. Available in capacities from 89 to 1292 cubic feet displacement per minute.





GARDNER-DENVER "WB" TWO-STAGE VERTICAL WATER-COOLED COMPRESSORS

1. High efficiency comparable to that of much larger compressors.
2. A rugged unit especially designed to conserve space.
3. Fully water-cooled for lower discharge temperatures.
4. Balanced construction assures quiet operation.
5. Built-in capacities from 142 to 445 cubic feet displacement per minute.

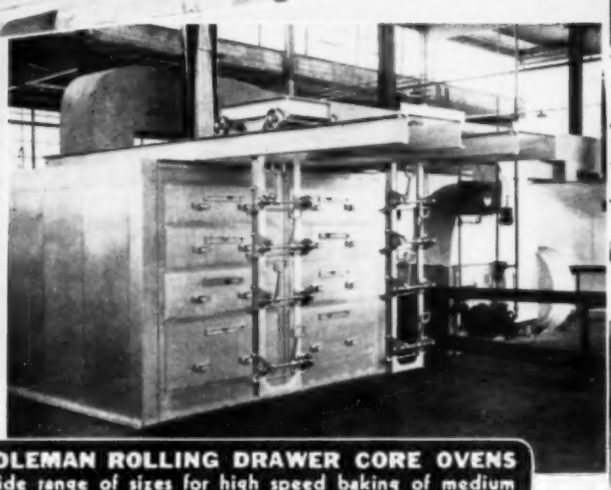
For complete information on Gardner-Denver "RX" and "WB" Air Compressors, write Gardner-Denver Company, Quincy, Illinois.

GARDNER-DENVER PRODUCTS HELP SPEED VICTORY

GARDNER-DENVER *Since 1859*

COLEMAN OVENS

COLEMAN CAR TYPE CORE OVENS
For all classes of heavy and medium cores.



COLEMAN ROLLING DRAWER CORE OVENS
Wide range of sizes for high speed baking of medium and small cores.

COLEMAN TRANSRACK CORE OVENS
Most popular all-purpose type of core oven. Wide range of standard sizes.

COLEMAN

Built by **THE FOUNDRY**

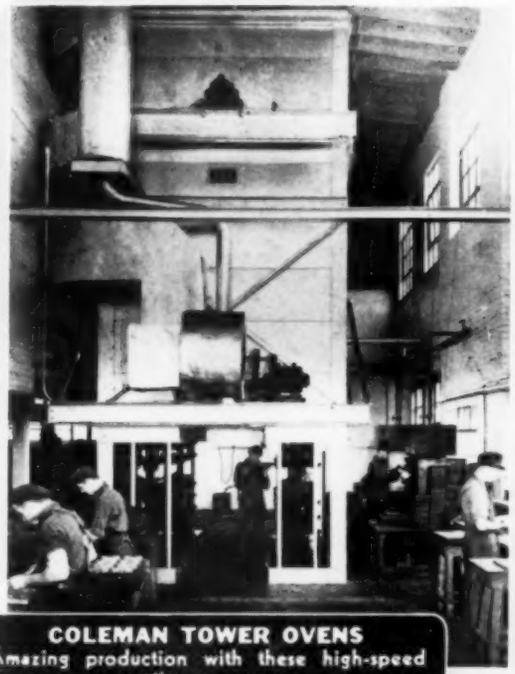
Cut Production Time!

● Not only 50 to 75% faster baking but better baking! These results, with less labor and less fuel, have made Coleman Ovens the confirmed choice of America's leading foundries everywhere.

Backed by 36 years' experience in building over 6,000 installations, every Coleman Oven assures utmost dependability in performance.

Wide range of sizes in all types, using all fuels, to meet extensive or limited core baking or mold drying requirements.

THE FOUNDRY EQUIPMENT CO.
BUILDERS OF COLEMAN AND SWARTWOUT OVENS
CONTRACTING ENGINEERS AND MANUFACTURERS
CLEVELAND, OHIO



COLEMAN TOWER OVENS
Amazing production with these high-speed continuous ovens.

COLEMAN CAR TYPE MOLD OVENS
Built in all sizes to handle all "dry sand" requirements.

CORE and MOLD OVENS

EQUIPMENT CO., Cleveland, O.

Dipped in "CORDIP" ...means CLEANER CASTINGS

CORDIP is the registered trade-name of a prepared core wash produced *only* by The United States Graphite Company. It is a combination of Mexican Graphite and other ingredients that requires but the addition of water to form the ideal core wash for dipping or spraying dry or green sand cores. It is simple to prepare and use, and is blended to give strict uniformity from batch to batch.

The cleaner casting, which CORDIP helps to produce, is made possible by a "turning" action that greets the molten iron as it contacts the treated surface. Naturally, when your castings reach the cleaning floor, their surfaces will be freer of sand; their smoother finish resulting in minimum cleaning costs and faster deliveries. Requisites such as these help today's modern high production foundry, speed parts to the country's great assembly lines.

MEXICAN GRAPHITE PRODUCTS

CORDIP
MEXITE BRIQUETTES
No. 8 MEXICAN GRAPHITE
MEXALOY
MEXICAN PLUMBAGO

To compensate for the various types and sizes of cores, CORDIP is made up in a number of grades, each especially developed for a specific kind of work. Whatever your problem, our general experience and this versatile product will develop a solution.

THE UNITED STATES GRAPHITE CO.
SAGINAW, MICHIGAN, U.S.A.

MAHON *Hydro-Foam* DUST COLLECTORS

1 Portable, Ductless Model

Automatically deposits dust directly under water from hooded, ventilated work bench, located on one or both sides. Requiring no ducts, it is especially applicable to the processing of magnesium alloys.

2 Stationary Model

For large plant operation, where dust must be collected from remote points by a system of hoods and ducts. Can be installed as an individual unit or set up in batteries to meet any capacity or requirement.

IF dust collection and removal is a problem in your plant, the Mahon *Hydro-Foam* process of dust elimination can quickly and economically dispose of your difficulty. Here is a system of dust removal that is completely automatic throughout . . . that operates on an entirely pneumatic principle . . . *depositing dust under water.* Mahon *Hydro-Foam* Dust Collectors have no moving parts other than the exhaust fan and sludge unloader. There are no spray nozzles, pumps or cloth screens. Hence there is nothing to clog, get out of order or be subjected to excessive wear. Let Mahon engineers show you what the superior *Hydro-Foam* method is accomplishing for others in your field . . . on some of the toughest possible jobs of dust elimination. It will cost you nothing to have the facts laid before you . . . may bring about important savings.

PROVED and IMPROVED *Features*

Highly Efficient 3-stage Dust Elimination under water

Completely Automatic from Intake to Sludge Removal

No Pumps • No Spray Nozzles • No Cloth Screens Nothing to Wear or Replace

THE R. C. MAHON COMPANY
DETROIT • CHICAGO

Metal Cleaning Machines, Rust Proofing Machines, Hydro-Filter Spray Booths, Ovens of All Types, Filtered Air Supply Units, Hydro-Foam Dust Collectors—and many Other Units of Special Production Equipment—including Complete Finishing Systems.

MAHON

READY NOW

ALLOCATION CLASSIFICATION SYSTEM

The new Allocation Classification System set up by the War Production Board goes into effect June 30, 1942. This system originally was referred to as "End-Use Classification."

The System is intended to furnish information needed by the War Production Board in allocation of materials and for the purpose of standardizing and simplifying the various forms now required of industry for allocation purposes.

After June 30, symbols designated in the Allocation Classification System must be indicated by every person—with certain stated exceptions—on all orders or contracts placed, as well as on all purchase orders or contracts calling for delivery after July 31, 1942.

Daily Metal Trade has prepared an 8-page booklet printed on high-grade paper covering the complete text of this important regulation affecting all industry. Many members of your own staff, as well as your customers will require copies for constant reference.

Send for your supply today. We can make immediate delivery at prices quoted below. Prices for imprinting Company name available upon request.

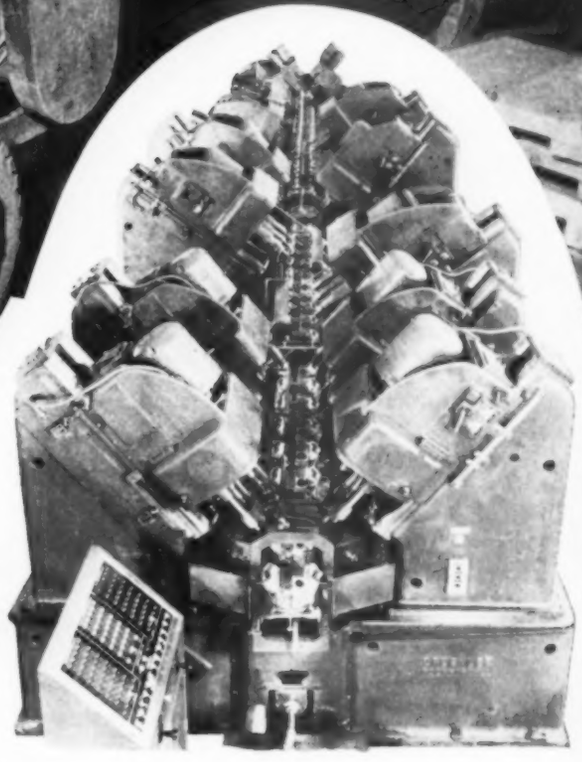
1 to 25	10 cents each
25 to 100	8 cents each
100 to 250	7 cents each
250 to 500	6 cents each
500 to 1000	5 cents each
1000	4½ cents each

Larger quantities at further discounts

Daily Metal Trade

1213 West Third Street, Cleveland, Ohio: Phone Main 8260

"With the Royer,



We Save Time"...says the manager of a Rockford grey iron foundry

Time is the most vital and important thing in our war production program today. Speed, speed and more speed! We need machines that do things faster if we are to beat the Axis at their game of total war!

The Royer Sand Separator and Blender delivers clean, open, evenly moistened, double-aerated, trash-free sand by an exclusive "combing belt" action—and does it with the speed you need. "It takes two of our best men to keep up with it," says this foundry official.

The Royer assures proper, high speed sand conditioning at all times—for all kinds of sand—for all kinds of castings. You can't afford to take chances on faulty castings from poorly prepared sand in these days when every minute counts. More Royers are being bought today than ever before because they are fast and efficient—because they fit in with the war-time order—"RUSH!"

Royers are made in six portable models, three stationary models, two combination scrap remover models—a type and size for every foundry, large or small, non-ferrous, grey iron, malleable or steel. Over 3,600 now working for Uncle Sam and more joining the firing line every day.

The mammoth machine tool plant of Greenlee Bros. & Co., Rockford, Ill., has been working three shifts, seven days a week, for eighteen months on defense orders. It is served by a foundry, melting 60 to 75 tons a day, in which Royers are doing a fast and workmanlike job. Greenlee Bros. & Co. transfer machine for machining airplane engine cylinder heads, is shown above.

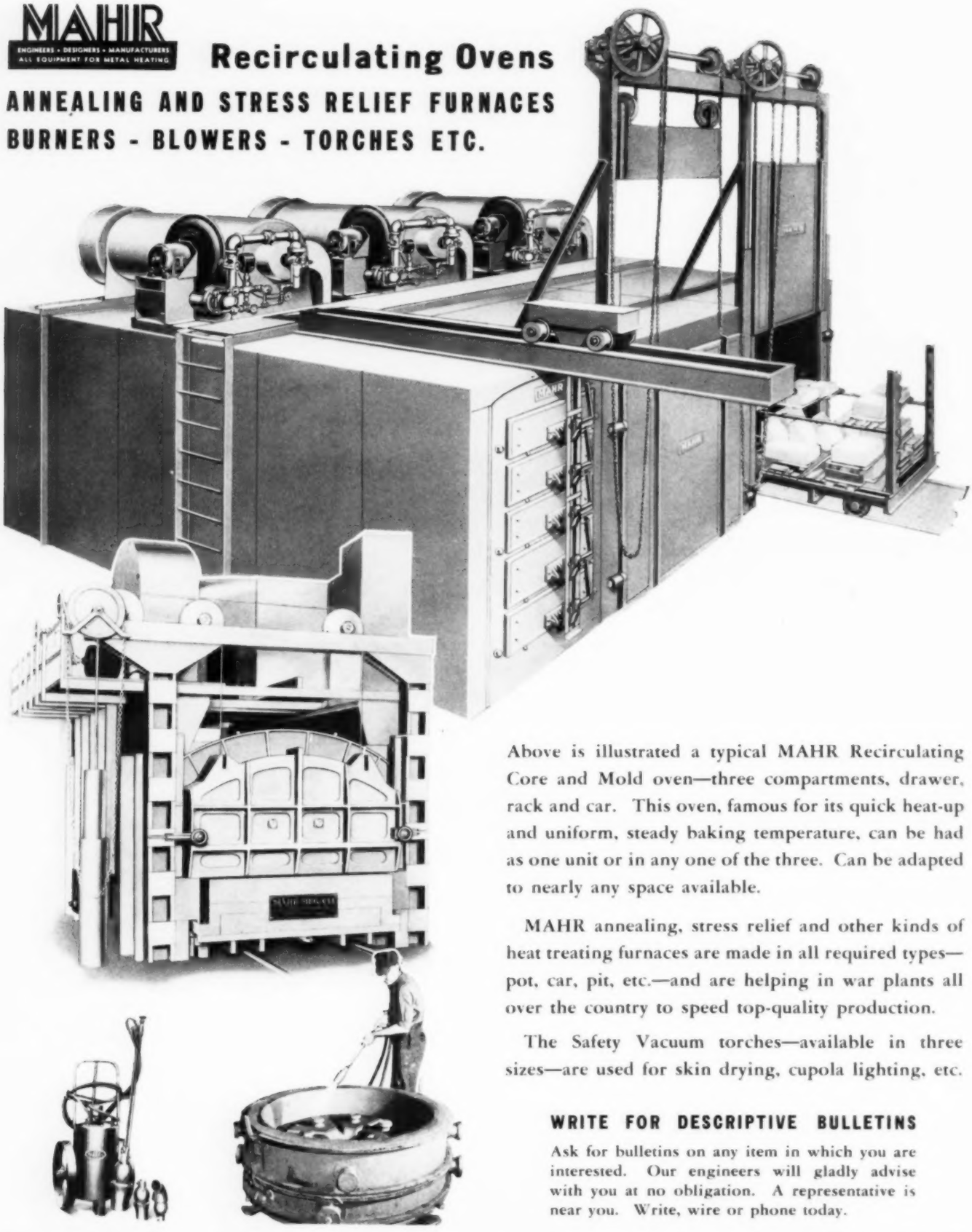
THE ROYER

ROYER FOUNDRY & MACHINE CO. *KINGSTON, PA.*

MAHR
ENGINEERS • DESIGNERS • MANUFACTURERS
ALL EQUIPMENT FOR METAL HEATING

Recirculating Ovens

ANNEALING AND STRESS RELIEF FURNACES
BURNERS - BLOWERS - TORCHES ETC.



Above is illustrated a typical MAHR Recirculating Core and Mold oven—three compartments, drawer, rack and car. This oven, famous for its quick heat-up and uniform, steady baking temperature, can be had as one unit or in any one of the three. Can be adapted to nearly any space available.

MAHR annealing, stress relief and other kinds of heat treating furnaces are made in all required types—pot, car, pit, etc.—and are helping in war plants all over the country to speed top-quality production.

The Safety Vacuum torches—available in three sizes—are used for skin drying, cupola lighting, etc.

WRITE FOR DESCRIPTIVE BULLETINS

Ask for bulletins on any item in which you are interested. Our engineers will gladly advise with you at no obligation. A representative is near you. Write, wire or phone today.

DIAMAHR

MAHR MANUFACTURING CO.
DIVISION OF DIAMOND IRON WORKS, INC.
MINNEAPOLIS, MINNESOTA, U. S. A.

With your foundry going great guns for Defense, you need the services of *all* your workers . . . and *they* need the safest and most comfortable protection for their work.

. . . Protect their eyes with AO Goggles.* American Ful-Vue Goggles, shown on the worker at the right, are good-looking, light, cool, comfortable. The goggles are equipped with American Optical Super Armorplate Lenses which screen out ultra-violet rays, absorb heat, resist flying particles.

. . . Protect their hands and fore-arms with AO Safety Gloves and Mittens made of high quality asbestos and chrome-tanned leather, reinforced at vital points.

. . . Protect their ankles and legs with AO Safety Leggings and Spats—made in asbestos, chrome-tanned leather and fire-resistant duck . . . snug, comfortable, easy to put on and off.

Your AO Safety Representative will help you plan an effective, economical head-to-ankle Safety Program. Call him in today.

*** N. F. A. Goggles — now supplied to you direct from AO—have snug leather masks, cool wire-screen ventilators, Deep-Curved Armorplate Lenses — either clear or glare-proof Calobar.**

American Optical Company

Southbridge, Massachusetts

PATENTED 174

How to Get TOMORROW'S NEWS *Today!*

FAST, ACCURATE, COMPLETE—That's the way you, the Foundryman, must have your news today. For no longer can you be satisfied by the grapevine method of learning what's new. For overnight new regulations released by the War Production Board and Office of Price Administration may seriously affect your business.

To protect yourself you must know today what may affect your business tomorrow—Daily Metal Trade provides this service to the foundry industry five days each week. Aggressive coverage by our reporters in major industrial cities assures you of the latest news of the industry each day. From Washington, complete coverage of government agencies, including WPB and OPA gives you the latest information on limitation orders and regulations.

Thousands of busy executives have found that Daily Metal Trade provides the vital, protective information necessary for efficient operation under wartime conditions. Save yourself time and worry. Enter your subscription to Daily Metal Trade today. The cost is only $15 per year. Fill in the order blank and mail it today. Your service will start immediately.

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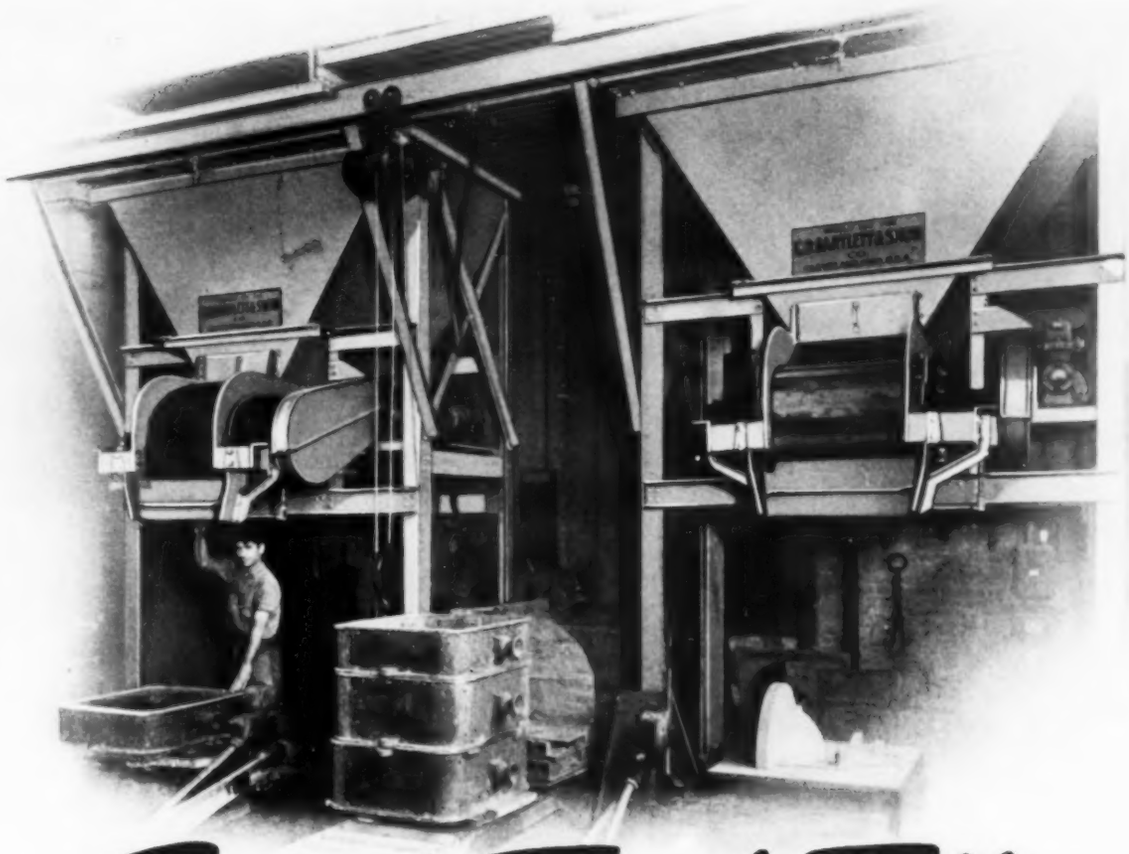


Single Flask Fillers

in pairs for making drags and copes

• Bartlett-Snow Flask Fillers are available in a wide variety of types and sizes,—including hopper and undercut gate flask fillers,—swinging chute flask fillers,—pivoted boom flask fillers,—stationary bin and apron feeder flask fillers (illustrated above), and various special types to meet unusual conditions.

The stationary bin and apron feeder flask fillers, most popular of the several types, are adapted readily to the floor space, head room, flask size and other conditions of the individual installation. The equipment can be mounted at any desired height overhead or placed on the floor. The bins vary in size from 5 ton to 20 ton capacity and usually are replenished with molding sand from a belt distributing conveyor. The apron feeders, at point of discharge, are fitted with deflecting plates, or swinging chutes, to catch a portion of the sand and deliver it to the distant corners of large flasks.

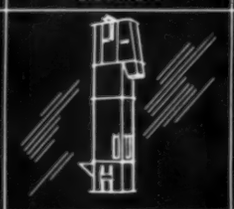
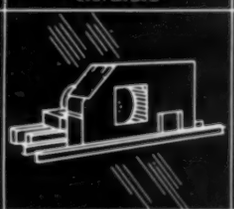
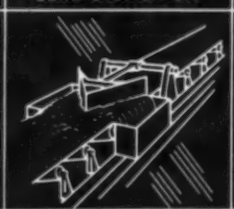
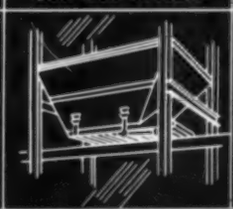
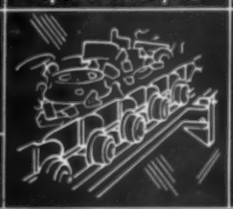
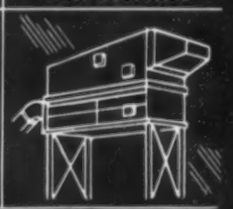
Our recently issued 40-page Bulletin No. 91 illustrates many different types of flask fillers,—and other Bartlett-Snow foundry equipment . . . Copies of this Bulletin are available on request.

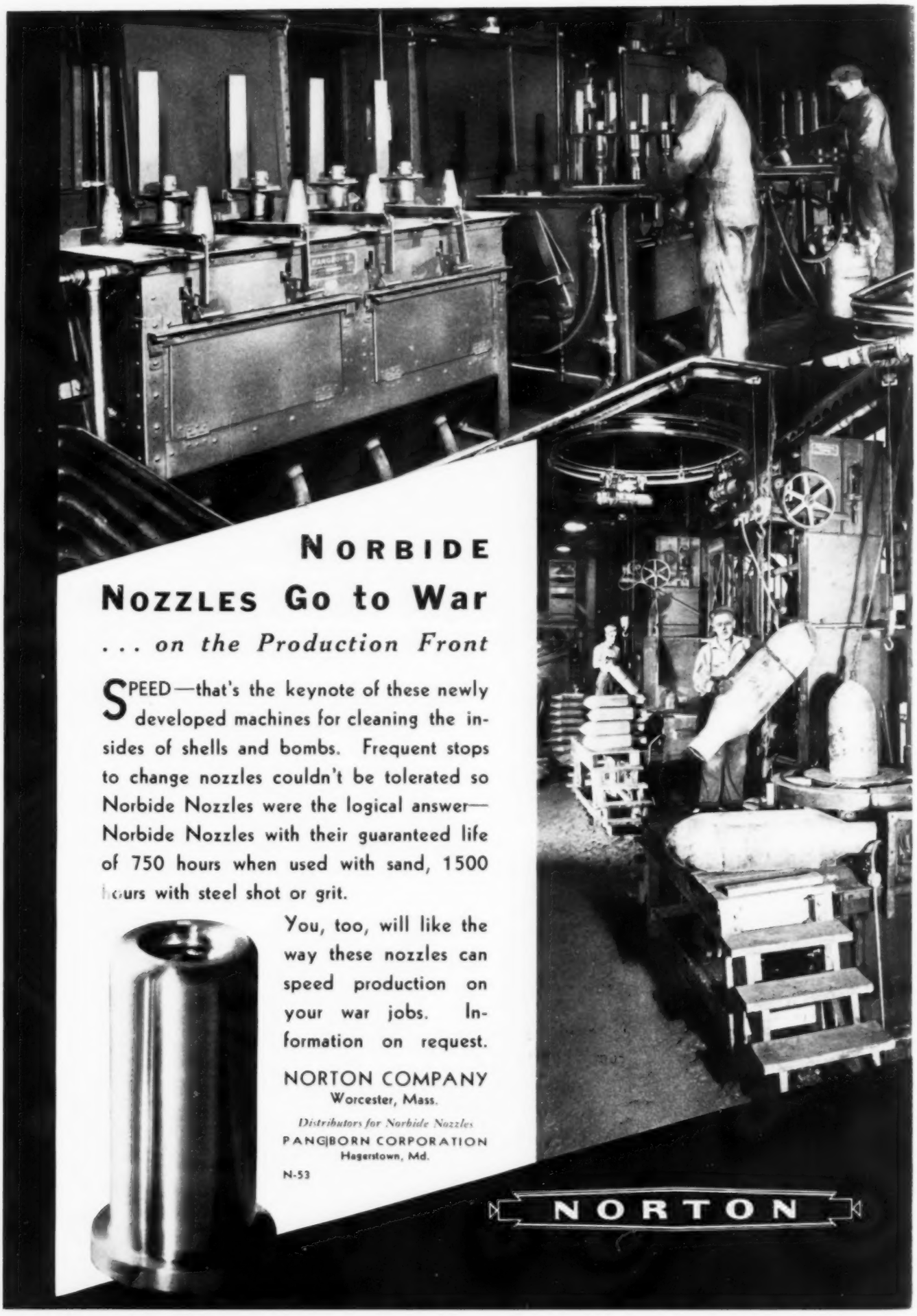
THE C. O. BARTLETT & SNOW COMPANY
6201 Harvard Avenue **Cleveland, Ohio**
Engineering and Sales Representatives in the Principal Cities

BARTLETT-SNOW

ENGINEERS AND FABRICATORS FOR THE FOUNDRY INDUSTRY

Complete Sand, Mold and Castings Handling Equipment for any requirement, including

Shakeouts	Elevators	Aerators	Sand Distributors	Bins and Feeders	Apron Conveyors	Dust Collectors
						



NORBIDE
Nozzles Go to War
. . . *on the Production Front*

SPEED—that's the keynote of these newly developed machines for cleaning the insides of shells and bombs. Frequent stops to change nozzles couldn't be tolerated so Norbide Nozzles were the logical answer—Norbide Nozzles with their guaranteed life of 750 hours when used with sand, 1500 hours with steel shot or grit.

You, too, will like the way these nozzles can speed production on your war jobs. Information on request.

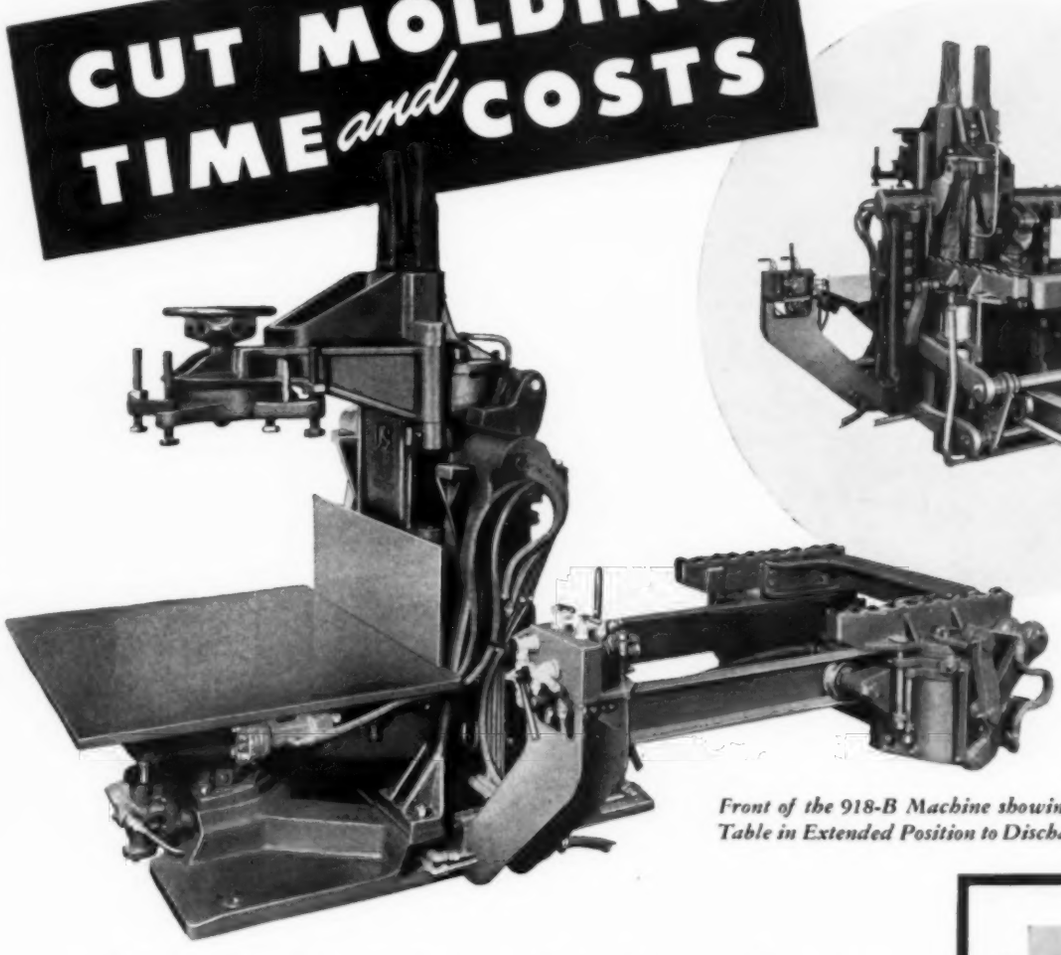
NORTON COMPANY
Worcester, Mass.

Distributors for Norbide Nozzles
PANGBORN CORPORATION
Hagerstown, Md.

N-53

NORTON

CUT MOLDING TIME *and* COSTS



Back of the 918-B Machine showing the Roll-out Table in Raised Position to Receive the Mold.

Front of the 918-B Machine showing the Roll-out Table in Extended Position to Discharge the Mold.

with Johnston & Jennings New No. 918-B Jolt Roll-Over Pattern Draw Machine

• This machine requires no pit and is of open end construction. It has a shockless jolt, free from rebound, and a perfect draw. An air operated clamp in the center of the table adjusts itself automatically for various height flasks and the automatic adjustable roll-out conveyor delivers the completed mold at the required height assuring accurate, uniform and speedy molding. This machine has a 44″ x 54″ table—20″ pattern draw and 2000 lb. capacity. Write today for descriptive catalog giving full information of this and other Johnston & Jennings molding machines.

THE JOHNSTON & JENNINGS COMPANY

867 ADDISON ROAD • CLEVELAND, OHIO

A COMPLETE LINE PROVEN IN SERVICE INCLUDING—

PLAIN AIR JOLTS
in 12 different sizes

JOLT SQUEEZERS
fast sturdy machines—3 sizes

JOLT STRIPPING PLATES
4 sizes ranging up to 16″ draw

JOLT, SQUEEZE, STRIPPING PLATE AND PATTERN DRAWS
Popular for medium service—2 sizes

PORTABLE JOLT ROLL-OVER AND PATTERN DRAW
A heavy duty thoroughly dependable machine—portable

JOLT ROLL-OVER AND PATTERN DRAWS
Fast large capacity machines with roll-out conveyors—4 sizes

Write for fully descriptive catalog giving complete specifications.

SPEED PRODUCTION

with

FANNER

CHAPLETS AND CHILLS

★

ACCURACY

★

CHOICE MATERIALS

★

ANY SHAPE, SIZE OR STYLE

★

The Most Dependable Source

THE FANNER MANUFACTURING CO.

BROOKSIDE PARK **CLEVELAND, OHIO**

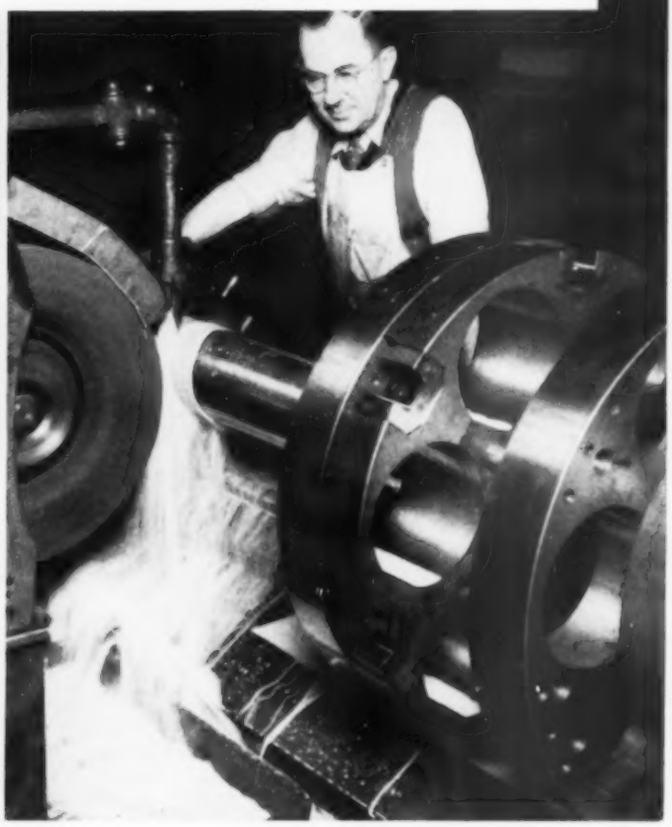
CANADIAN FANNER, LTD.
HAMILTON, ONTARIO

TO PLANT SUPTS.

This is one of a series of ads addressed primarily to new grinder hands. If you would like additional copies without our signature, for your bulletin board, tell us how many you need.

How to get better and longer service from your grinding wheels...

• The war imposes a double task on industry and a patriotic responsibility on grinder hands. Speed of production has to be increased, without waste of basic materials. With grinding playing such an important part in production, these simple rules may help you do your job better!



1 USE THE RIGHT WHEEL IN THE RIGHT PLACE

Given data on the type of grinding job, the character of metal to be ground, the amount of stock to be removed and the finish desired, a grinding wheel manufacturer can give you a wheel in the right grit, grade, grain, bond, shape and size to meet definitely your grinding conditions—a wheel that will last longer, do better work at reduced grinding costs. And sales engineering service will help you to select the right wheel for every job.

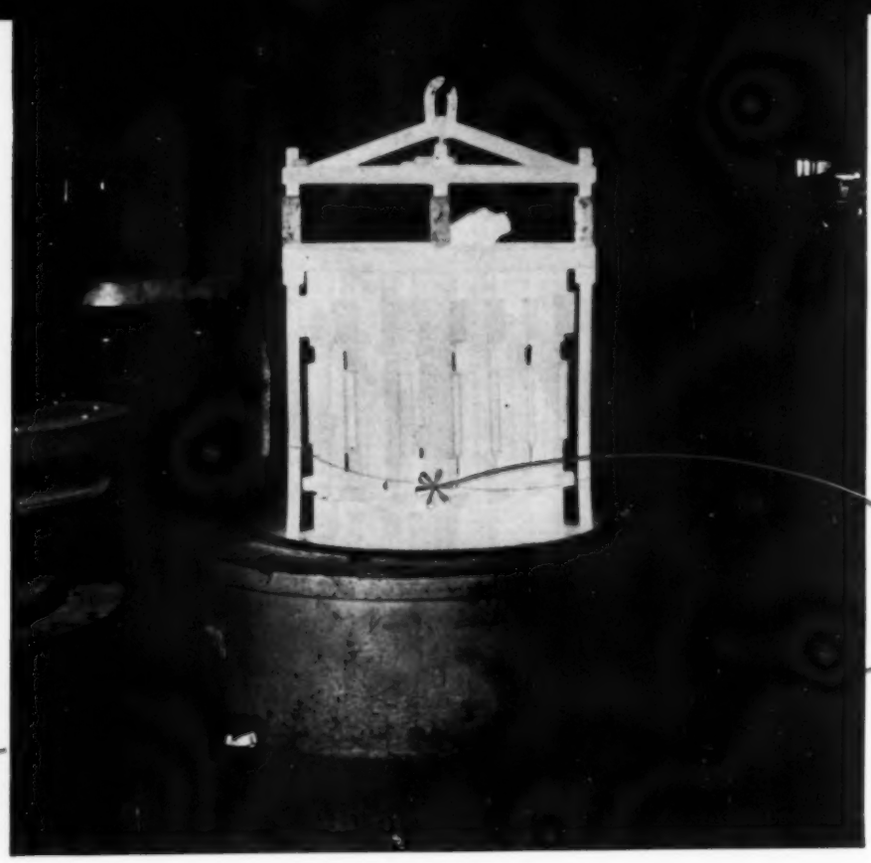
2 MAKE SURE YOUR GRINDING SET-UP IS RIGHT ON EVERY JOB

Manufacturer's recommendations should be carefully followed on wheel speed, work speed, proper coolant, wheel traverse, rate of infeed etc. Only the correct balance of these factors gives you the full advantage of properly specified wheels. One of the services performed by grinding wheel sales engineers is to check your grinding conditions on the job and point out the best method of carrying out the grinding operation.

THE CARBORUNDUM COMPANY • **NIAGARA FALLS, N. Y.**

REG. U. S. PAT. OFF.

(Carborundum is a registered trade-mark of and indicates manufacture by The Carborundum Company)



*NEW HEATING PRINCIPLE

BRINGS ALL THE ADVANTAGES OF 100% FORCED CONVECTION HEATING IN THE ANNEALING, NORMALIZING, AND HARDENING RANGES

THE 250° F. to 1750° F. temperature range of the Super-Cyclone, with the heating and control accuracy within that range, combines a hardening, normalizing, annealing, tempering, and nitriding furnace into one.

A typical example of the furnace's versatility is the normalizing job shown in the above illustration. These forgings are SAE 3450 and weigh 126 pounds each. The heating cycle starts with 12 of these forgings (1512 lbs.) loaded on a fixture, heated to 1650° F. in the Super-Cyclone, removed, and air cooled to 400° F. On the same fixture, they are charged into the Super-Cyclone again and heated to 1500° F., held 1 hour at this temperature and then oil quenched to 400° F. The charge is then put back into the same Super-Cyclone for tempering at 1100° F. and held for 4 hours. The entire operation is done in the one Super-Cyclone without handling the forgings, once they are placed on the fixture.

The previous method of handling was to heat these forgings in a radiation type box furnace. The capacity of the box furnace was 5 pieces. Time to heat them to 1650° F. required 5 hours, which included 1 hour for soaking at that temperature.

Normalizing in the Super-Cyclone, 12 forgings are heated in 2½ hours, including the soaking time of 1 hour at 1650° F. This is a production increase nearly 5 times greater than the old method of heating.

The forgings from the box furnace required straightening after the heating operation, whereas the 100% forced convection heating principle of the Super-Cyclone in minimizing distortion, produces straighter work, thus eliminating extra handling time for straightening as previously required.

With the box furnace, 2 men were required to handle the forgings individually in loading and unloading the furnace. In the Super-Cyclone, once the fixture is loaded, one man can handle the 12 forgings through the entire heating operation.

This Super-Cyclone normalizing, hardening, and tempering job is typical of the furnace's flexibility and the savings available through greater production, reduced handling time, and straighter work.

SUPER-CYCLONE QUENCHING

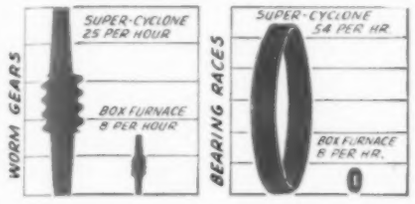
When the first Super-Cyclone was being designed, Lindberg Engineers anticipated the obvious problem of mass quenching of heavy loads and devised equipment to take care of the situation. A typical example is the 1512 lb. load of forgings shown in the illustration above, which is heated and quenched, fixture and all. Jobs similar to this are being quenched with perfect results, every day, in plants all over the country.

Heat treaters who have seen the Super-Cyclone in action, quickly appreciate that to secure all the advantages of which the furnace is capable, the quench must be looked at from an entirely new standpoint. This involves quench tank size, oil velocity, volume of oil, cooling, and storage.

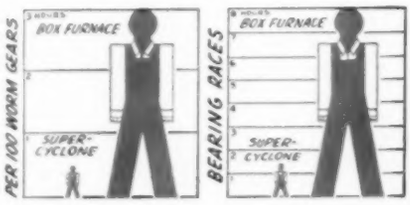
Twenty-one months of production experience in our own plant and in the field, with nearly 200 installations, have enabled Lindberg Engineers to work out an accurate formula which greatly simplifies this problem.

LINDBERG FURNACES

SUPER-CYCLONE INCREASES PRODUCTION because work is stacked up or piled up on a fixture, rather than laid out in one layer as in conventional equipment. The 100% forced convection heating principle of the Super-Cyclone then brings the work to temperature rapidly, accurately, and uniformly. The charts below show Super-Cyclone production increases over radiation type box furnaces which were previously used on these bearing race and worm gear jobs.



SUPER-CYCLONE REDUCES HANDLING TIME. With a temperature range from 250° F. to 1750° F. and accurate control therein, the Super-Cyclone is a flexible unit for any heating operations within that range. The forgings on the opposite page are normalized, hardened, and drawn, in the same Super-Cyclone, on the same fixture, effecting a substantial reduction in handling time. The charts below, represent a handling time comparison between the Super-Cyclone and the radiation type box furnaces that were previously used on these bearing race and worm gear jobs.



SUPER-CYCLONE KEEPS WORK STRAIGHTER. The 100% forced convection heating principle prevents distortion by eliminating any possibility of radiant heat striking the charge. Heated air is driven through the charge at high velocity, resulting in a rapid, uniform, and accurate heat. With distortion reduced to a minimum, valuable man hours are freed from the straightening press for use on other work. It might be noted that the above chart does not include an additional 7½ hours handling time for straightening the 100 worm gears from the box furnace.

IMPORTANT NOTE: Like all other Lindberg developments, the Super-Cyclone has been thoroughly proved under 24 hour a day production conditions for a minimum of 12 months before announcement to the trade. To date, nearly 200 Super-Cyclones are in service from coast to coast. One or more of these installations is near you, as is a Lindberg District Office, staffed by practical and competent sales engineers. The Super-Cyclone is *not* a cure-all, nor do we represent it as such, however, it is speeding production, turning out straighter work, and cutting costs for many firms. We will be glad to survey its possibilities for you, on your work, at your request.

CYCLONE FOR TEMPERING

Here is the production proved tempering furnace that can help you meet today's toughest production schedules. Thousands of Cyclones are now employed all over the country for low cost, accurate tempering, annealing, and stress relieving. The Cyclone, with a temperature range of 250° F. to 1250° F., increases production, reduces rejections through accurate heating control, and cuts operating costs.

Employing the 100% forced convection heating principle, the Cyclone increases production by heating the charge rapidly and uniformly. The work is soaked in heated air that is recirculated through the charge under pressure. The Lindberg Throttling Control adjusts the input of heat to meet the requirements of the load, thus assuring accurate temperature control, hardness tolerances of plus or minus 1 Rockwell "C", and reduction of operating costs.

Lindberg Cyclone Tempering Furnaces are available in a wide range of standard sizes of the vertical or box type, electric or gas fired. For more specific information may we suggest you write for bulletin Number 53—Gas Fired Vertical, Number 13—Electric Vertical, and Number 62—Electric Box Type, or phone your local Lindberg representative, who will be glad to demonstrate the advantages of this low cost, accurate tempering furnace.

Whether the charge be a dense load of bolts, as shown above, or large pieces of heavy section, the Cyclone Tempering Furnace's 100% forced convection heating principle heats them rapidly and accurately, holding them to extremely close hardness tolerances.

HYDRYZING FOR HARDENING

NO SCALE
NO DECARB
NO CARBURIZATION

Maximum production runs of punches, dies, and other tools can be obtained with the scale-free, decarb-free, and carburization-free hardening of Hydryzing. The neutral, controlled atmosphere of the Hydryzing Furnace is fool-proof, and easy to regulate to meet the needs of all types of steel. It turns out work that is clean and hard, right on the surface, thus eliminating the need for costly grinding, stoning, or polishing.

The products necessary to produce the neutral Hydryzing atmosphere, charcoal, anhydrous ammonia, and benzol are readily procurable in any locality, thus forestalling any production delays due to the need for special equipment.

The standard Hydryzing Furnace is built in a wide range of sizes from heavy production types to tool room furnaces. It is also made in Rotary Drum, Rotary Hearth, Tilting Hearth for bright hardening, and Conveyor types, to meet the requirements of various jobs.

More detailed information may be obtained on these controlled atmosphere furnaces by asking for bulletin Number 94.

Visible on the Hydryzing Furnace in the photo at left is the outside door curtain, the special replaceable door sealing gasket, the vestibule protection plate, and in the lower left hand corner, the foot pedal which controls the automatically operated door. The advantage of the outside door curtain, which is placed immediately below the chamber opening, is its greater transparency and ease of access for cleaning and maintaining.

LINDBERG ENGINEERING COMPANY • 2453 WEST HUBBARD STREET • CHICAGO

SUPER-CYCLONE FOR ANNEALING, NORMALIZING, HARDENING, TEMPERING, AND NITRIDING

HYDRYZING FOR SCALE-FREE AND DECARB-FREE HARDENING

CYCLONE FOR LOW COST ACCURATE TEMPERING

IS 24 HR. OPERATION OF COMPRESSORS, DIESELS, ETC., CAUSING COMPLAINTS ? ? ? ? ?

Are people near your plant complaining of noise at night? If so, and the noise is from the air intake on Diesels, compressors, etc., here's the solution:

Model DS

PROTECTOMOTOR SILENCER-FILTER FOR DIESEL ENGINE INTAKE

The Model DS Silencer-filter hushes the most raucous air intake—plus preventing the entry of abrasive foreign matter. It's a double duty filter—helping to prevent complaints due to night operation, saving excess wear on engines and compressors due to intake of abrasive dust. More than 750,000 Protectomotors of similar construction have been sold since 1920. Quickly and easily installed, the Model DS provides capacities and threaded or flanged connections for any engine or compressor.

MODEL DS CONSTRUCTION FEATURES

A. Series of cylindrical rectifying chambers of scientific diameter to length ratio which smooths out sound waves.

B. Dry Feltex Filtering Medium 99.8% efficient by University of California Laboratory tests.

C. Radial Fin Construction. Permits large area of filtering medium to occupy smallest possible space.

D. Rigid, galvanized mesh frame.

E. Reinforcing tube. The Model DS Protectomotor is "built like a battleship."

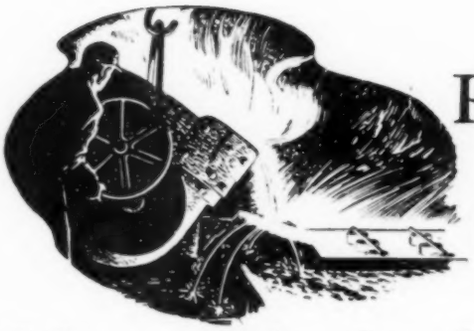
Always Reduces Engine Wear—May Prevent a "Nuisance Action"

NEW CATALOG

44 pages, completely illustrates and describes filters for ventilation and pipe lines as well as engine intake. . . . . .

STAYNEW FILTER CORP.
36 Centre Park, Rochester, N. Y.
"Air Filter Headquarters"

PROTECTOMOTOR 99 9/10 Per Cent EFFICIENT AIR FILTERS



PRODUCTION FOUNDRY Uses "SMZ" ALLOY to make Motor Blocks from Low-Grade Materials...

Ladle Additions of This Balanced Graphitizing Alloy Help Produce a Dense Cylinder Iron With Good Machinability.

GOOD scrap is not available to this foundry, yet it is achieving low-cost production of cylinder iron of 1.80 to 1.85 per cent silicon content and 3.25 to 3.30 per cent carbon. The iron has the necessary machinability and good shrinkage characteristics.

The iron is melted from a charge of 20 per cent malleable pig iron, 30 per cent steel, 20 per cent remelt scrap, and 30 per cent briquetted borings. On occasions, the charge has even included detinned cans. Each 1000-pound charge contains five to eight one-pound "EM" Silicon Briquets.

The iron comes from the cupola at about 2,800 deg. F., and the "SMZ" Alloy is added to the molten stream in the cupola spout. The alloy is apparently completely absorbed in the stream before the metal reaches the ladle. This addition of "SMZ" Alloy produces a machinable iron with freedom from chill even in thin sections.

"SMZ" Alloy is a deoxidizing and graphitizing material containing silicon, manganese, and zirconium. Because of its balanced composition, this alloy produces better results than these metals added separately.

When added to cast iron in the spout or ladle, it produces these beneficial results:

1. It converts a normally hard white iron into a high-strength gray iron.
2. It reduces the chill of gray iron and minimizes wall sensitivity—prevents chilling of thin sections.
3. It produces a better microstructure in the iron, improving strength and physical properties.

•

Our metallurgists will gladly tell you more about "SMZ" Alloy and other "Electromet" ferro-alloys for the foundry. They will give you practical help in using them to advantage. Ask for this service, or write for further information. There is no obligation.

ELECTRO METALLURGICAL COMPANY

Unit of Union Carbide and Carbon Corporation

UCC

30 East 42nd Street New York, N. Y.

Distributed through offices of Electro Metallurgical Sales Corporation in Birmingham, Chicago, Cleveland, Detroit, New York, Pittsburgh, and San Francisco. In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario.

Electromet
Trade-Mark
Ferro-Alloys & Metals

"EM," "SMZ," and "Electromet" are registered trade-marks of Electro Metallurgical Company.

DELTA FOUNDRY PRODUCTS

DELTA CORE AND MOLD WASH FOR STEEL

Delta Core and Mold Wash is being adopted more and more by modern steel foundries throughout the nation.

For armor plate castings, steel cast shells ... and all other types of steel castings used for war purposes.

PRINCIPAL IMPORTANT FEATURES OF DELTA CORE AND MOLD WASH

- ✓ **MOISTURE PROOF** — When thoroughly dried, will not absorb moisture.
- ✓ **NO PRECIPITATION** — Stays in suspension indefinitely when properly mixed with silica flour and water.
- ✓ **HIGHLY REFRACTORY** — Molten Metal lays on surface without the least disturbance.
- ✓ **UNUSUAL HIGH FUSION** — When mixed with good 140 mesh silica flour, the fusion point is over 3100 degrees F.
- ✓ **NO GAS** — It is non-reactive with molten metal and liberates no gaseous vapors.
- ✓ **ADHERES TO SAND SURFACES** — Penetrates into sand surfaces, which prevents flaking, peeling, scabbing, when in contact with molten metal.
- ✓ **EASY TO APPLY** — Can be sprayed, swabbed, dipped or brushed on either green or dry sand surfaces.
- ✓ **PRODUCES SMOOTH SURFACES** — Casting surfaces are free from burn-in or metal penetration.
- ✓ **CUTS CLEANING COSTS** — Surfaces are smooth and require minimum amount of cleaning.
- ✓ **ECONOMICAL TO USE** — Costs less per pound and covers greater surface area than any other core and mold wash.

For grey iron, malleable and non-ferrous castings use DELTA GRAKOAT, BLACKOAT and NON-FERROUS KOAT for core and mold washes. They are waterproof and non-reactive in contact with molten metal.

DELTA PARTEX - NUT SHELL PARTING

DELTA PARTEX PARTING, the modern scientific Lycopodium replacement, is used by the majority of the leading foundries. Most aluminum foundries casting air-cooled cylinder heads for fighter and bomber planes have adopted it as a substitute for Lycopodium. It is the most efficient parting available ... insuring better core and mold surfaces. Absolutely safe and non-hazardous. Economical . . . costs only a fraction of the cost of Lycopodium.

DELTA NO-VEIN COMPOUND

Another distinct contribution of Delta Research Laboratories to the Foundry Industry. A specially compounded series of oxides . . . developed and tested for not strength with the use of the Dilatometer . . . and proven in actual practice, for over two years, in many of the nations leading foundries. NO-VEIN COMPOUND eliminates veining . . . cuts cleaning room costs . . . insures improved casting surfaces.

In addition to DELTA vital foundry products now so necessary to our War Production Program . . . DELTA OIL PRODUCTS COMPANY IS THE WORLD'S LARGEST MANUFACTURER OF RECOIL OILS. Constant research has enabled us to develop superior oils, for gun recoil mechanisms, which must meet the most exacting specifications . . . and our greater facilities insure constant flow of this vital war material to our armed forces everywhere . . . on land, sea and in the air.

But this is only one of our many responsibilities in the great war effort for Victory.

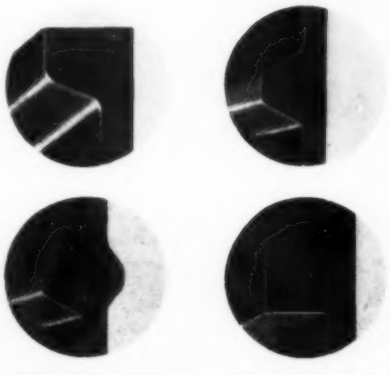
DELTA OIL PRODUCTS CO.

MANUFACTURERS OF INDUSTRIAL AND AUTOMOTIVE OILS, GREASES, AND COMPOUNDS

MILWAUKEE WISCONSIN

For Production NOW.
COMPACT • *They save space*
DURABLE *and* CONVENIENT
for SPEEDY MOLDING!

...*over* 3500 FOUNDRIES PREFER MODERN STERLING FOUNDRY FLASKS



All-welded, integral ribs and flanges; solid center reinforcing rib; square flanges; full width bearing, aids speed and accuracy . . . simplifies ramming and shaking out. (Pat. 1974292)

LINED up today on the PRODUCTION FRONTS of America's war-working foundries, are thousands of veteran Sterling Flasks. Because of their compactness alone, they are speeding production of vital war material. Engineered on standards of indestructibility . . . designed for speed and convenience in operation . . . the advantages of Sterling Flasks multiply for the "E"xcellence answer industry seeks in war work . . . Consult STERLING for complete foundry flask service.

Sterling FOUNDRY FLASKS

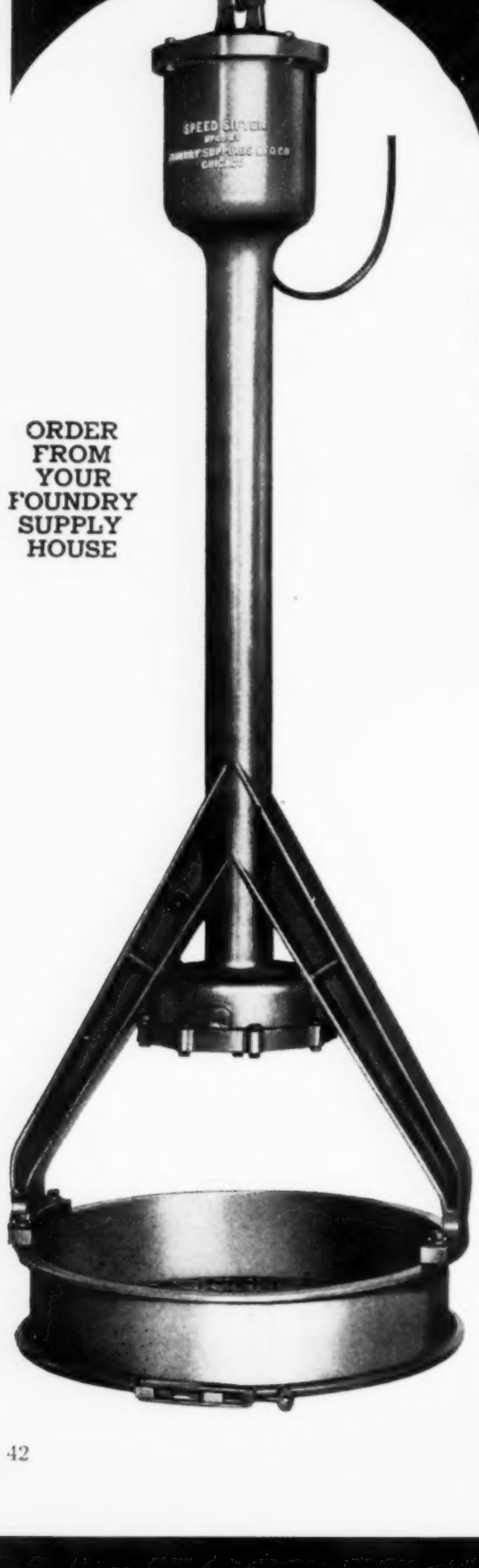
Flasks in all sizes, styles and shapes . . . all-welded, special rolled steel sections . . . strong but light, for speed and endurance.

STERLING WHEELBARROW COMPANY • MILWAUKEE, WIS., U. S. A.

A 3776-1P

Increase Production with
ROTOPLANE Speed Sifters

"Hard-to-Please" Foundries Standardize on Rotoplane!



ORDER FROM YOUR FOUNDRY SUPPLY HOUSE

Try ROTOPLANE in your plant. You, too, will find it increases production, does *all* your sifting more quickly and economically. One size and type for all sifting jobs.

ROTOPLANE is built for long, dependable service. Strong, one-piece frame gives remarkably effective vibration. Smooth, free, rotary action. All mechanism completely enclosed and dustproof. Weight approx. 90 lbs., 62 in. high overall.

Steel-mounted sieves instantly interchangeable. No jagged screen edges, no storage problem. 20 in. diameter clear sifting area.

TEN DAYS FREE TRIAL.

$175.00 f.o.b. Chicago—complete with cable, safety ground wire, one sieve (2-4 mesh). Standard ⅓ h.p. motor, 115-230 volts 60 cycle single phase.
Prices with other motors quoted on request.

ELECTRIC VIBRATORS

True-to-pattern castings make satisfied customers . . . more repeat business. Increase your production and castings quality with RED Electric Vibrators. Sturdy, dustproof, lowest operating cost (electricity does not freeze). Unequaled for consistent year-'round results in foundries all over the world.

(All Prices f.o.b. Chicago)

No. 1—Light match plate work..... $10.00	No. 5—Heavy match plate, tub, bench $17.00
No. 2—Medium match plate 13.00	No. 9—Machine and heavier 24.00

•

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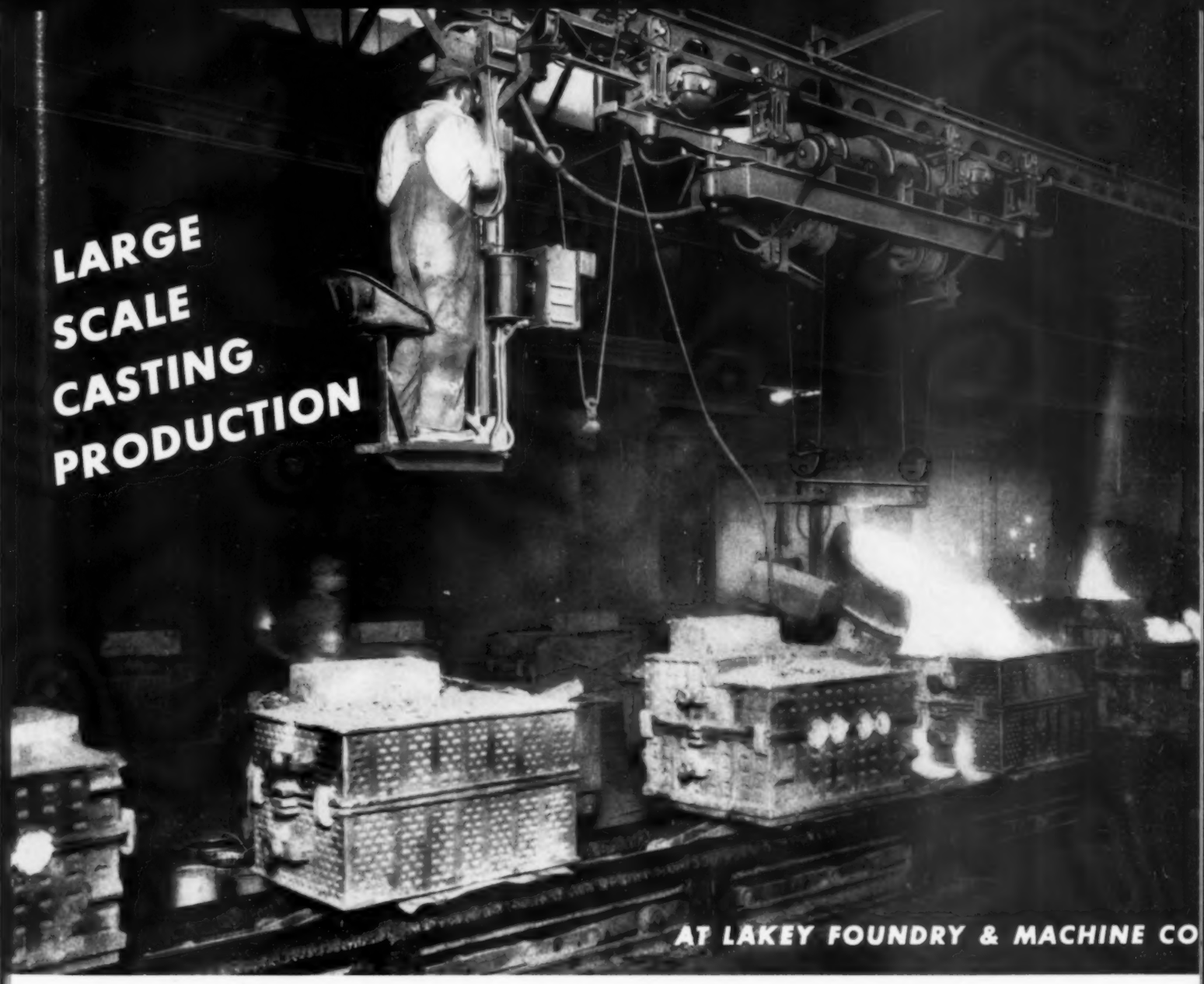

Cleveland Tramrail is a very important factor in the production of casting at The Lakey Foundry & Machine Co., Muskegon, Michigan.

It makes possible a very high output of castings varying in weight from one-half pound to 1000 pounds.

Five 2-ton Cleveland Tramrail motor-driven platform-controlled carriers with hand-tilting ladles have the capacity to deliver 450 tons of molten iron per working day, direct from the cupolas to several continuous production lines where molds are traveling along on a drag-chain conveyor. They also supply hot iron to a line of 9 or 10 small floors which are serviced with smaller ladles.

Cleveland Tramrail equipment is used throughout many other departments such as core sand handling, core handling, pouring small castings, stoney shake-out, loading tumbling barrels and many miscellaneous small jobs where mechanical handling is found desirable.

Cleveland Tramrail permits taking the load directly to destination by the shortest route without hindrance from floor obstructions. No rehandling of hot metal is necessary. Hot iron reaches the molds with a minimum loss of heat. The men are kept at a safe distance from the heat.

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THE CLEVELAND CRANE & ENGINEERING CO.
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OVERHEAD MATERIALS HANDLING EQUIPMENT

G-E X-RAY UNIT

Production Boosted 10 Times!

HERE'S PROOF THAT G-E X-RAY CAN HELP YOU

If you manufacture armament, aircraft, munitions, or other material vital to victory, and you require x-ray in your inspection facilities, here's full proof that you can rely on the recommendations of G-E Industrial X-Ray Engineers, and you can depend on G-E Industrial X-Ray apparatus to insure quality, speed production, and to cut rejects.

In one of the nation's leading foundries, production of heavy armament castings bogged down badly when inspection fell far behind schedule.

G-E X-Ray Engineers were called in to assist in establishing an inspection system that would keep up with production. And here's what happened:

QUALITY INSURED. X-ray examination pointed the way to better casting techniques and resulted in improved castings—castings that are better built to withstand the severe shock and stress to which they are subjected.

PRODUCTION BOOSTED 10 TIMES! Using a high-power G-E Industrial X-Ray Unit, the plant's inspection engineers, in collaboration with G-E Industrial X-Ray men, worked out inspection methods that kept inspection far ahead of production. So far, in fact, that the plant's production has been increased 10 times its original quota.

REJECTS CUT. Better casting technique reduced rejects, and x-ray examination provided an accurate guide to sound repair by welding. Thus, expensive castings are kept off the scrap heap, valuable time and materials are saved, and repairs are speeded up.

All of this adds up to doing a better job. And doing it faster, more economically than it has ever been done before. This case history is but one of hundreds that can be found in the performance records of G-E Industrial X-Ray Units at work in virtually every type of industry. It is typical of the reasons why the majority of the nation's leading industrial concerns have selected G-E Industrial X-Ray Units as best suited to meet their needs.

To get full information about the complete line of G-E Industrial X-Ray apparatus, and to request the services of a G-E Industrial X-Ray Engineer to help you apply x-ray to your problem, fill in and mail the coupon, today.

☐ We are interested in industrial x-ray inspection; please have your G-E Industrial X-Ray Engineer call on us.

☐ Please send us a copy of the catalog which describes and illustrates G-E Industrial X-Ray Equipment.

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Films, Film-Processing Chemicals, Screens, Cassettes, and other accessories to make G-E's the world's most complete single-source x-ray supply line—available from 35 direct factory branch offices.

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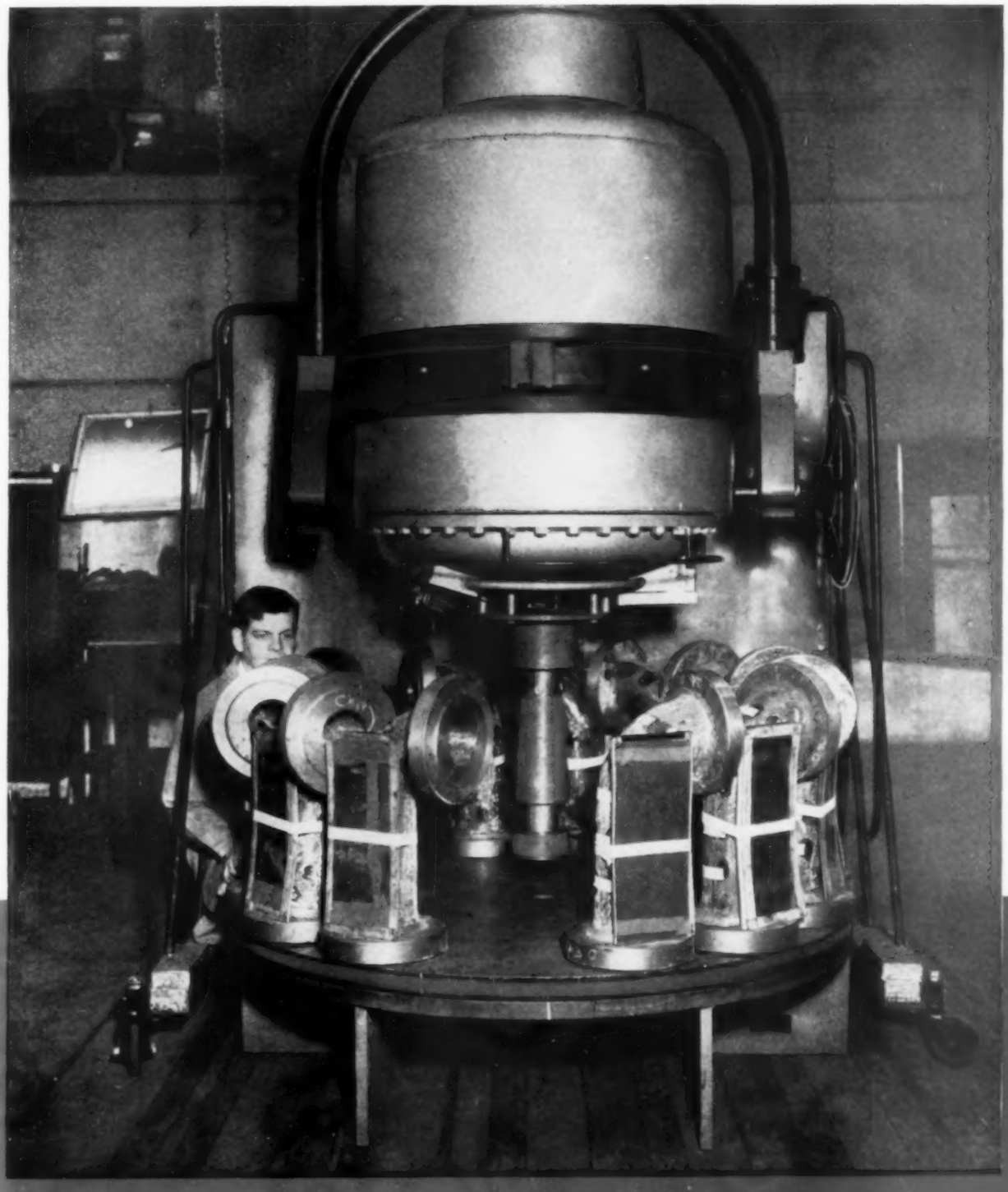
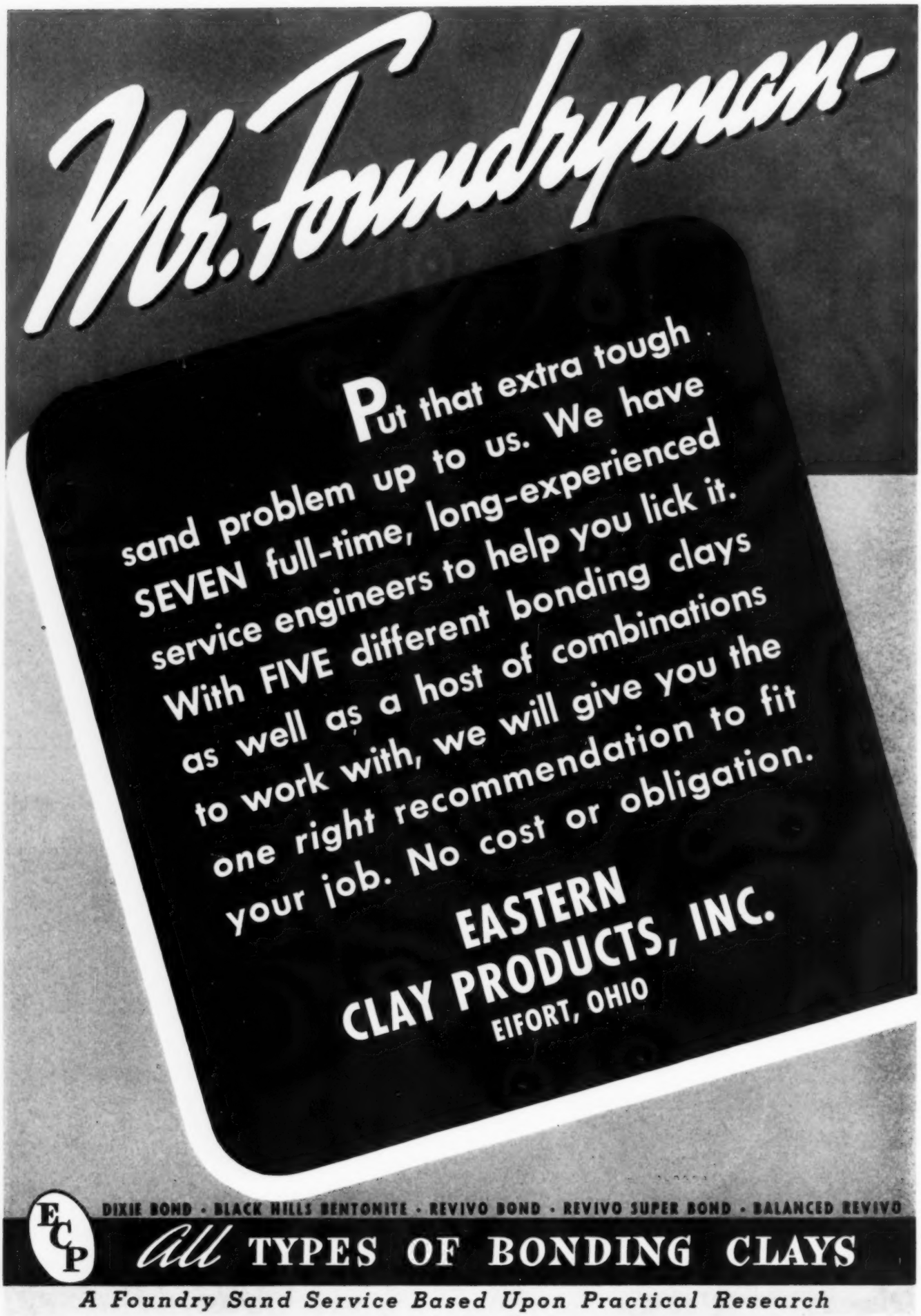
SPEEDS INSPECTION...



MULTIPLE RADIOGRAPHY of heavy steel castings. With the G-E million-volt x-ray unit you can radiograph a number of individual castings, of the same or varying sizes, simultaneously with a single exposure.

Today's Best Buy – U.S. War Bonds


Mr. Foundryman-
Put that extra tough sand problem up to us. We have SEVEN full-time, long-experienced service engineers to help you lick it. With FIVE different bonding clays as well as a host of combinations to work with, we will give you the one right recommendation to fit your job. No cost or obligation.
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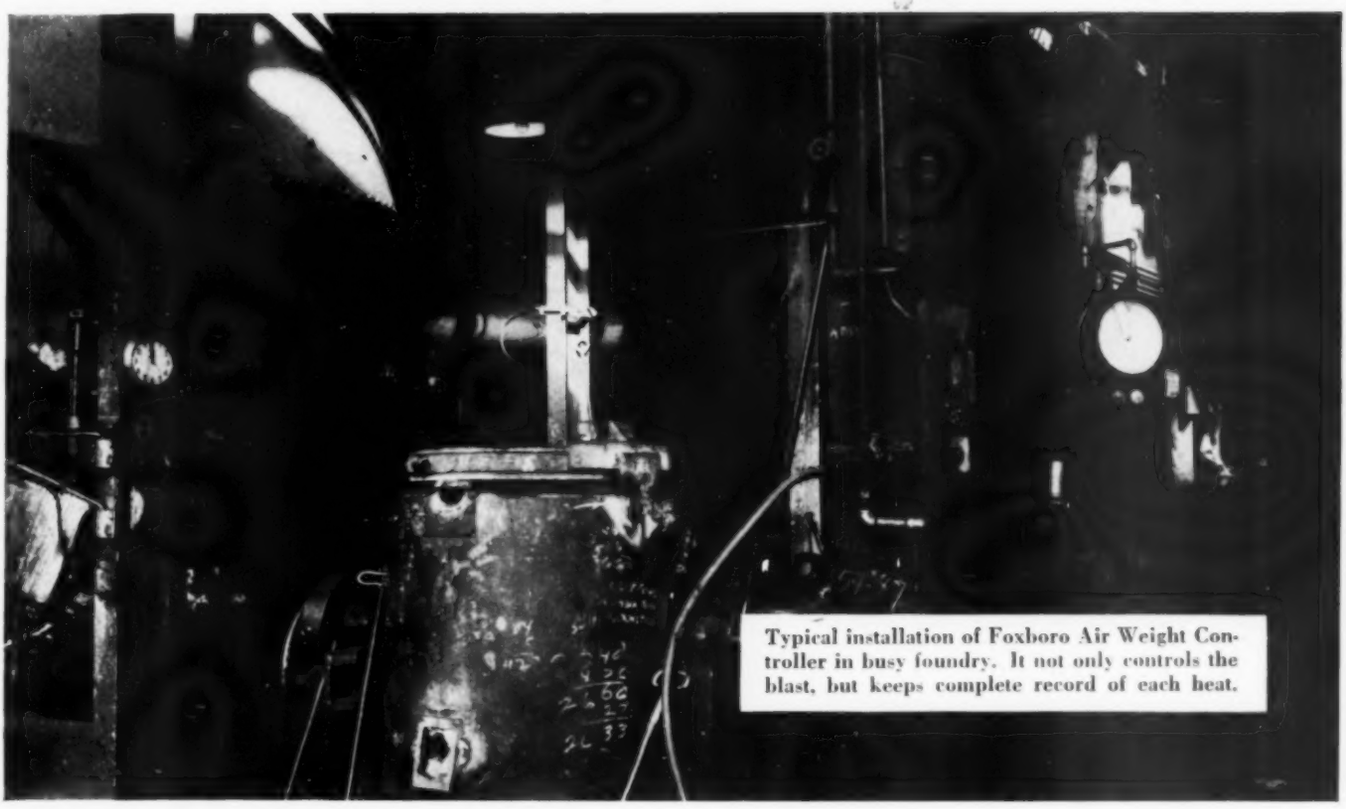
All TYPES OF BONDING CLAYS
A Foundry Sand Service Based Upon Practical Research

This "Phantom Foundryman"

SPEEDS UP CUPOLA OUTPUT!



Typical installation of Foxboro Air Weight Controller in busy foundry. It not only controls the blast, but keeps complete record of each heat.

Easily-installed Foxboro Air Weight Controller keeps heats hotter, more uniform.

All you need to do is set the index pointer on a Foxboro Air Weight Controller, and you'll get the rate of blast you want . . . more exactly than any human hands can maintain it for you! Day-in, day-out, regardless of weather conditions, this "phantom foundryman" automatically controls air supply *by weight* instead of volume . . . insures better combustion and uniformly hotter heats without oxidation of metal.

The effective output of most cupolas can be stepped up promptly by the simple installation of this unique Foxboro Controller. Scrap is radically reduced . . . pigging is completely eliminated . . . your percentage of faulty castings can be held to new lows!

Write for Bulletin B-268 on Foxboro Air Weight Controllers, or for detailed information on any other instruments you may need. The "Phantom Foundryman" is only one example of Foxboro's Creative Instrumentation to make industrial processes operate more productively. **The Foxboro Company, 32 Neponset Avenue, Foxboro, Mass., U. S. A.** Branches in principal cities of U. S. and Canada.

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JAR SQUEEZERS ★ ★

FOR FAST AND EASY OPERATION

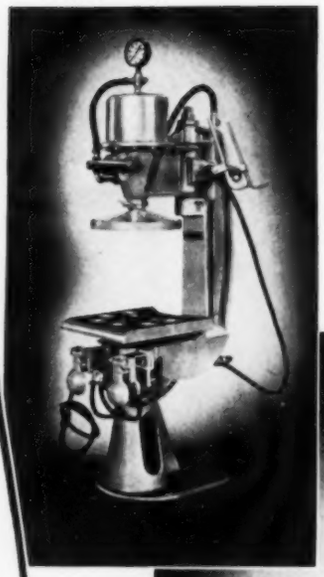
1 TOP SQUEEZE TYPE—Swing head mounted on a ball thrust bearing. Jarring table is centered directly over its support. Furnished in stationary and portable types.

2 CANTILEVER TYPE—A light portable machine with squeeze cylinder in the base. Cantilever squeeze yoke leaves machine open at the sides. Easy movement to and from squeezing position.

3 YOKE TYPE—Squeeze cylinder in base. Open at back to accommodate wide flasks. Counterbalanced spring adjustment for changed weight as yoke is raised or lowered to handle shallow or deep flasks.

4 COLUMN TYPE—10-inch diameter squeeze cylinder in base. Open at sides. Easy swing.

In addition to the standard Tabor machines shown, we also build machines for special work or unusual conditions, combining the functions of different types. Write for descriptive bulletins.



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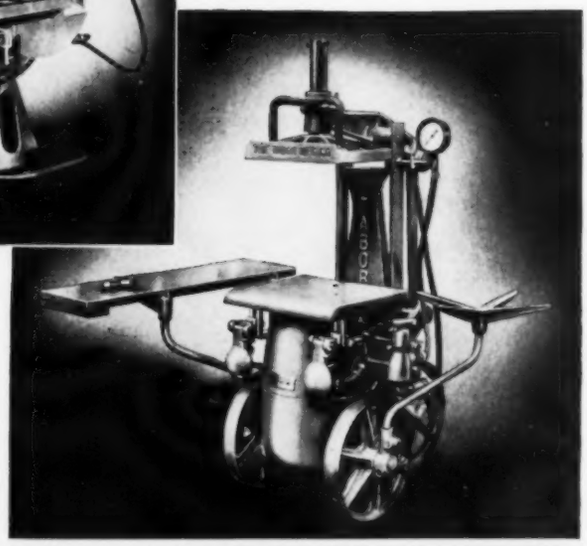

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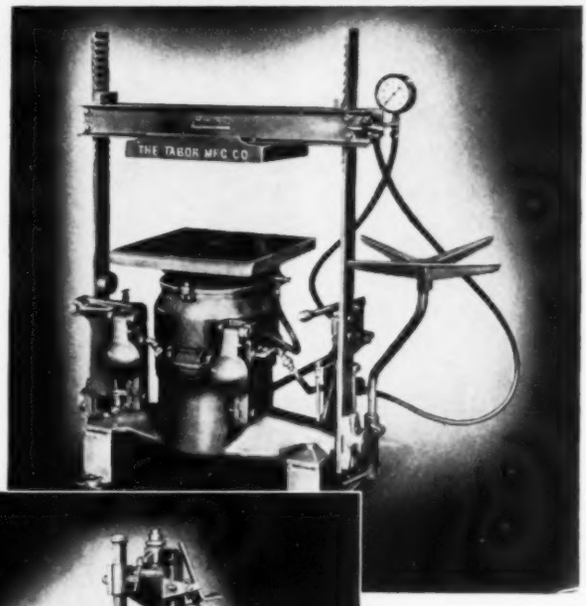

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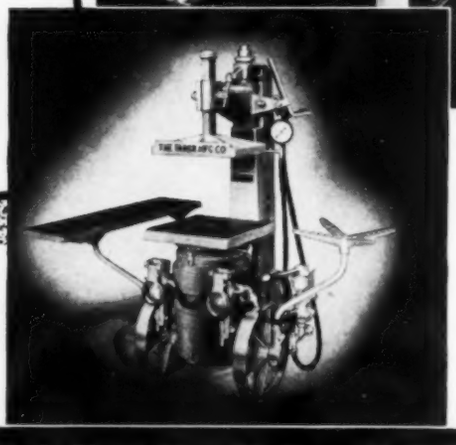

4

THE TABOR MANUFACTURING COMPANY
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Representatives: Snyder Foundry Supply Co., *Los Angeles, Calif.;* Pacific Graphite Works, *Oakland, Calif.;* Carl F. Miller & Co., *Seattle, Wash.*

SWINDELL FURNACES IN FOUR WARS have made METAL FOR VICTORY!

today

. . . modern Swindell Electric Furnaces such as this are speeding production of fine steels for better implements of war—as faithfully and effectively as Swindell products have served since the simple iron furnaces of ninety years ago.

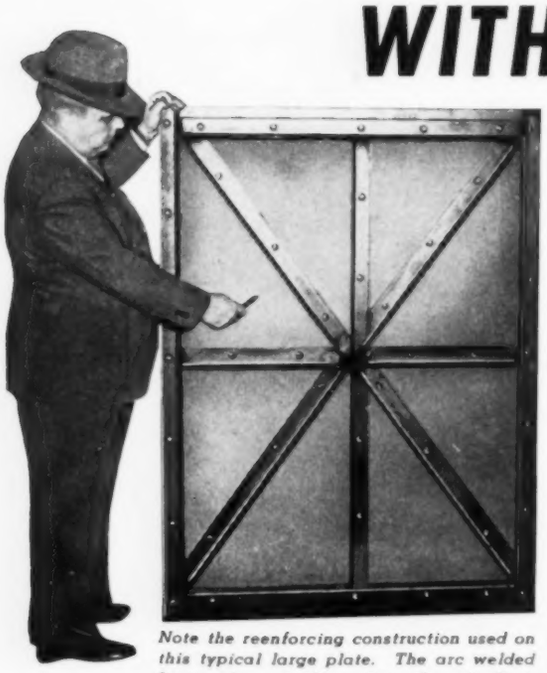
Present-day Swindell design, saving *time and labor* with swinging roof for rapid top-charging, features exclusive integrated construction which assures smooth performance under capacity-plus demands.

SWINDELL-DRESSLER *Corporation*

DESIGNERS AND BUILDERS OF MODERN INDUSTRIAL FURNACES

PITTSBURGH, PA.

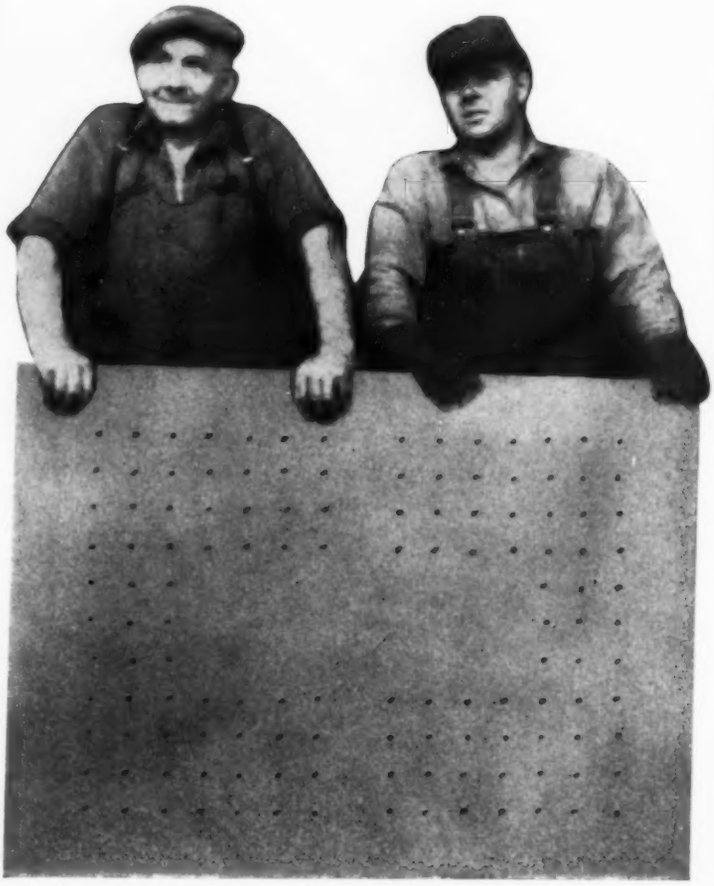
CARRY CORES UP TO 1200 LBS. WITHOUT DEFLECTION!



Note the reenforcing construction used on this typical large plate. The arc welded frame gives rigidity, strength and eliminates deflection.

IT IS BEING DONE ON DIAMOND REENFORCED STEEL CORE PLATES

These special core plates are designed to carry large cores up to 1200 lbs., cores of any size, without deflection or warping.



You may obtain Diamond Core Plates to suit your own special requirements. They are furnished with or without perforations and in all smaller, standard sizes—plain or reenforced as indicated by your needs.

Send us detailed information on your core baking problem and we'll be glad to design a plate to handle the job. Weight of core and dimensions, in particular.

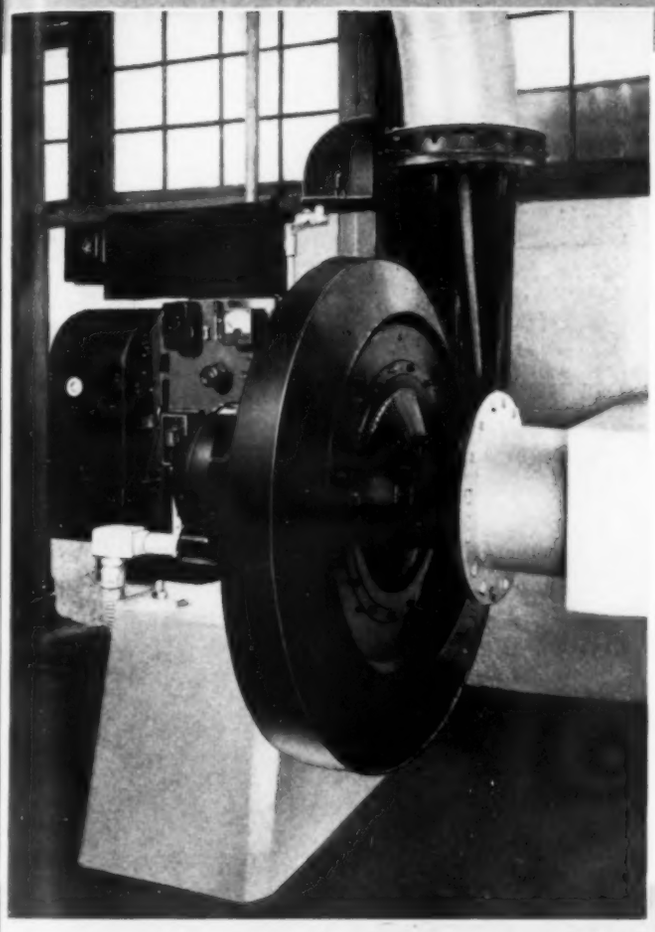
DIAMOND

CLAMP AND FLASK COMPANY

Telephone 2553 **Richmond, Indiana**

Designers of* CORE PLATES, JACKETS, BANDS, FLASKS *since 1889

This HEAVY-DUTY BLOWER
WEIGHS THE AIR GOING TO YOUR CUPOLA



A Control Backed by 15 Years of Foundry Use. The constant air-weight control of the Ingersoll-Rand Cupola Blower is an all-electric mechanism developed around the power characteristics of these machines. It requires no pampering, no laboratory conditions for accurate regulation of the air blast.

Simple, Compact Assembly. Few machines for foundry use require less attention and maintenance than the Ingersoll-Rand Cupola Blower. Its single rotating element is carried on grease-packed ball bearings which require greasing but once or twice a year.

- **LESS COKE**
- **INCREASED MELTING RATES**
- **FEWER REJECTS**

Write or call the nearest Ingersoll-Rand branch office for complete information.

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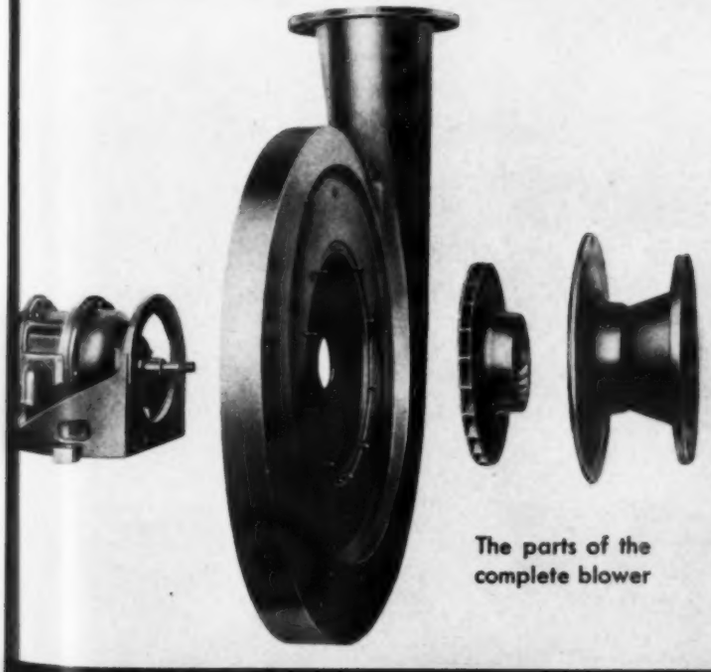
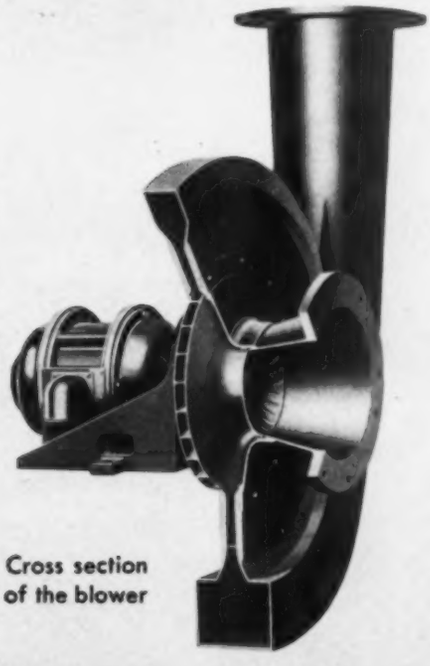


The parts of the complete blower



Cross section of the blower

Motor-operated blast gate

Control panel

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Every Farm!

Every Household!

Every Manufacturing Plant!

Can still contribute largely to increasing the supply of scrap which is absolutely necessary to the production of the Vital Equipment required to win the War.

☆ ☆ ☆

GET YOUR SUPPLY QUICKLY TO THE PROPER COLLECTING AGENCY – THE TOTAL WILL BE

Surprisingly Great!

Ohio Ferro-Alloys Corporation

Canton, Ohio

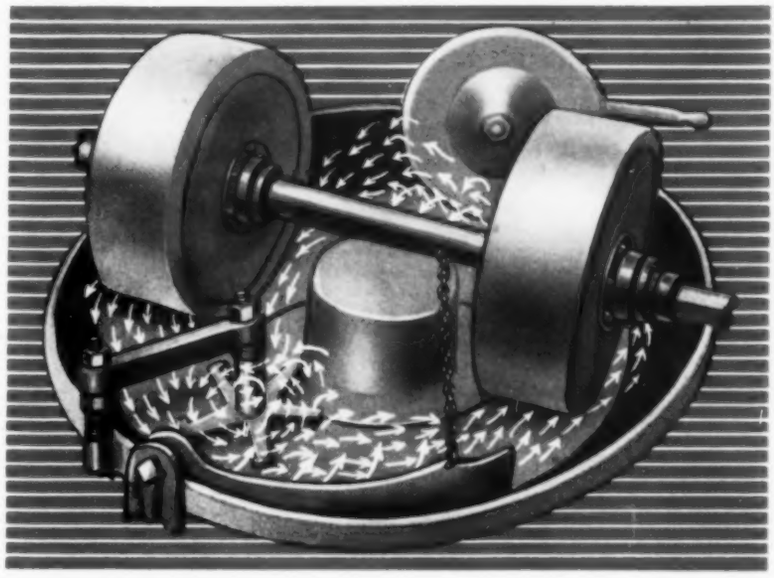
SPEAKING OF THE CLEARFIELD

HERE ARE SOME UNSOLICITED, AND "UN-RETOUCHED" COMMENTS OF USERS:

" . . . As you know, we have two of your 9 ft. sand mixers, which were installed about two years ago. These machines have operated very efficiently and we are entirely satisfied with their performance."

" . . . The mixer is functioning perfectly. We have had no difficulties even of a minor nature."

" . . . We have nothing but praise for this mixer. We think it will pay for itself in two years in labor cost alone."



" . . . More speed, better bonded sand and better all around results —this is the report of our foundry superintendent."

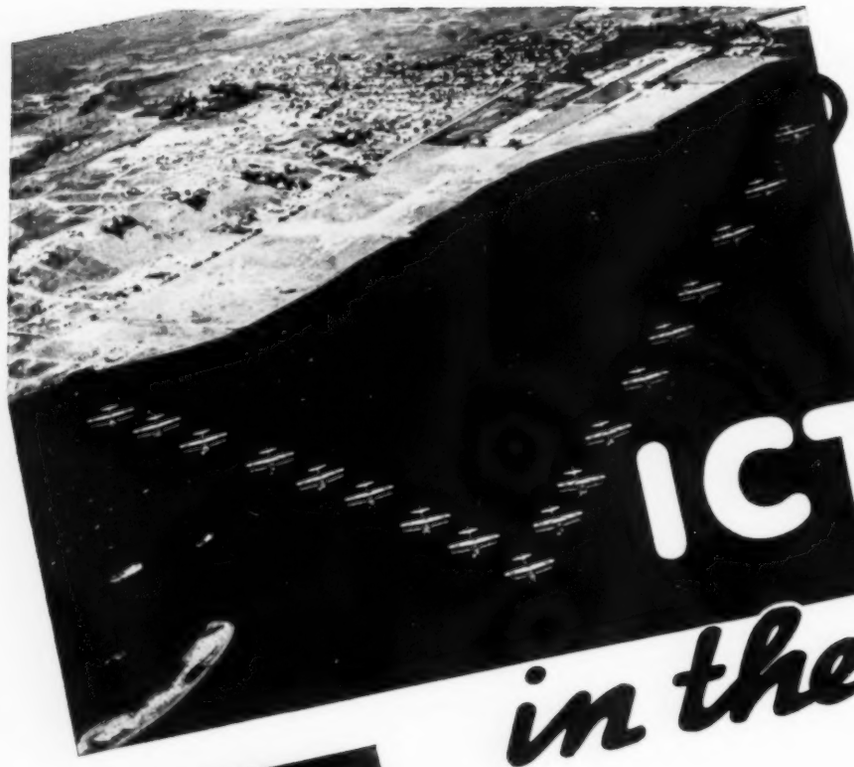
" . . . The performance of our Clearfield Mixer purchased from you a year ago has been so good that we feel it has paid for itself already. Our sand is vastly improved."

" . . . Referring to our recent order for mixer we want to tell you that the machine sold itself on the performance of the one we bought from you some years ago."

" . . . Our mix is very good, and much better than we formerly obtained."

" . . . Your mill is doing an excellent job."

CLEARFIELD
MACHINE COMPANY
CLEARFIELD
PENNSYLVANIA, U. S. A.

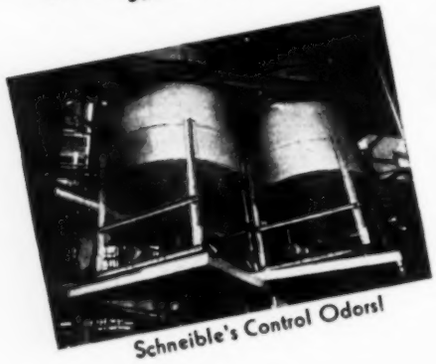


Navy scouting planes in formation — Official U.S. Navy photo

ICTORY in the Air....

Schneible's Control Dust!

Schneible's Control Fumes!



Schneible's Control Odors!

Castings, good castings — are important components of every plane, tank, ship, gun, machine tool and ordnance part. Parts needed so badly today to complete the first phase in our national offensive and defensive war building program. Good castings, and lots of them, result from proper operating conditions and the employment of modern casting production tools. Proper ventilation of all dust creating operations, too, is an essential of maximum casting production, and Schneible Multi-Wash collectors are the simple, economical answer to lowest cost dust control. Made in standard units, dust collectors, pumps and dewatering equipment that can be arranged to suit any operating condition in any size or type of foundry; Multi-Wash systems have won a victory over dust, fumes and odors in hundreds of foundries.

Operation is automatic — no maintenance needed. No bags to clean — no dry dust to handle — no nozzles to clog — nothing to burn, freeze or rapidly wear. Just uses water over and over as the dust collecting medium. Available in small units for isolated operations, senior and junior units for medium to large size plants and with separate or central dewatering systems for simple sludge disposal.

Let us tell you how a Schneible Multi-Wash Dust Collector will cut costs for you!

CLAUDE B. SCHNEIBLE COMPANY

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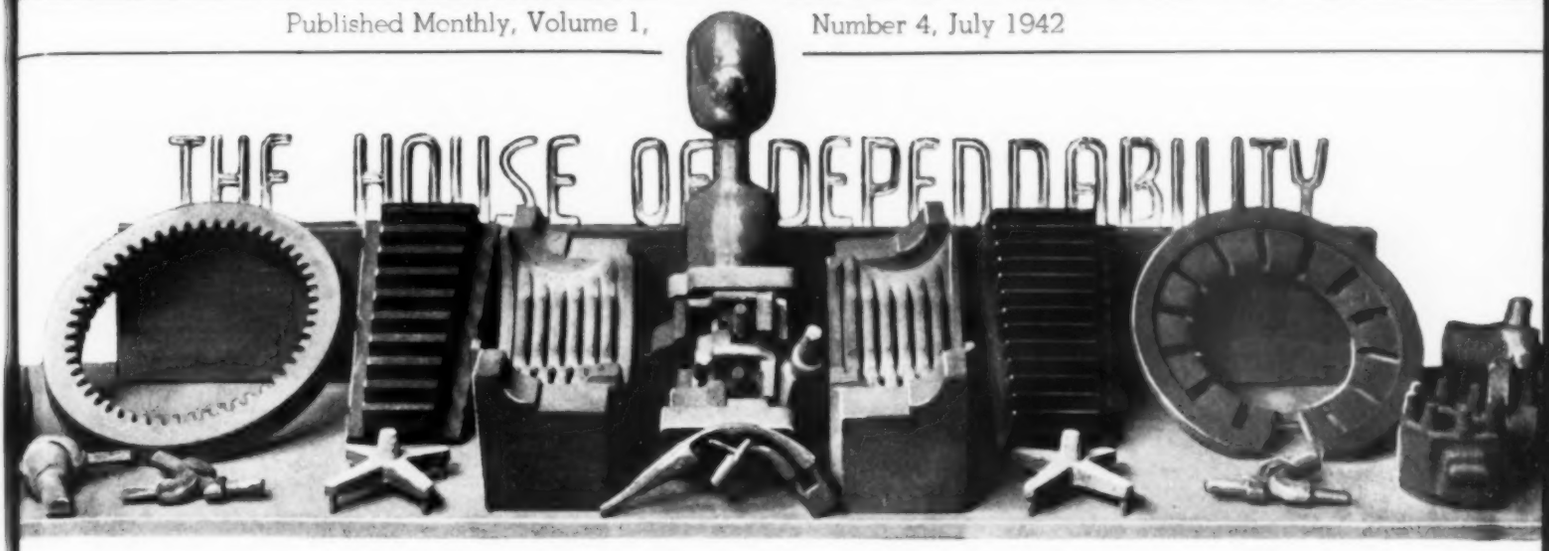
SCHNEIBLE

The CORE OIL DOCTOR

Devoted to new ideas and case study reports on core room practice

Published Monthly, Volume 1, Number 4, July 1942



Typical cores made by war production manufacturers with certified core oil are shown as displayed at the recent foundry convention.

CERTIFIED CORE OIL which is used in every part of the country and by many of the largest and best known foundries has long been known as "THE DEPENDABLE CORE OIL"—dependable because those foundries know every shipment is strictly uniform in quality, which is definitely assured by laboratory control from the time raw materials are placed on our track until the finished core oil is shipped whether the order be a tank car or single drums.

Our modern plant is fully equipped with the latest devices to speed up deliveries and those foundries located at distant points may have speedy delivery from the various cities stated in this advertisement where complete stocks of our oils are carried.

For every type of casting there is a *correct* grade of Certified Core Oil which will definitely enable you to eliminate core oil worries by producing the right strength of core with firm edges, smooth working in the boxes and prevent sand crusting so readily when left lying on the benches during the warmer weather, by reducing baking time, core breakage and cleaning costs, and last but not least, by holding to an absolute minimum the amount of gas created when the metal is poured, regardless of whether the metal be steel, semi-steel, grey iron, malleable or non-ferrous.

Many foundries on war production of all types have solicited the cooperation of our laboratory in an effort to speed up production and eliminate annoying difficulties. It is only necessary to send us a 4 oz. sample of whatever core oil you are using, and about 5 lbs. of your core sand, stating the oil-to-sand ratio, whether or not any other binder is used, and the oven heat employed, so that we may make a test with your own materials and furnish a chart showing the maximum tensile strength of cores and surface hardness, when that maximum strength is reached, and complete general information. If no sand sample is sent, we will use washed silica sand 50 mesh. The facilities of our laboratory are at the disposal of every foundry large or small, and there is no obligation whatever.

The "V" flag flies high on our mast head just below Old Glory at our new 350,000 gallon plant. Here in the world's largest exclusive core oil manufacturing establishment is found the ultimate in high speed laboratory controlled core oil production equipment.

Questions and Answers

Question: Please tell us what causes our large cylinder cores to split open during baking: advise how this can be remedied?

Answer: Your trouble is usually due to one or all of the following causes:

(1) Excessive water in the mixture.

(2) The sand you use is too fine.

(3) Excessive baking heat is being used.

If moisture is unable to leave the center of the cores freely during the baking process, it will cause the cores to "explode" which can usually be remedied by using a more coarse sand and/or reducing the amount of water used.

It may also be advisable to reduce your oven temperature and bake your cores for a longer period of time.

There may be other causes for the trouble you are having but generally speaking "core splitting" is due to the causes given above.

Have you developed a special core room technique which would be of help to others? If so, send a brief description of it to us for inclusion in this column.

CERTIFIED CORE OIL & MFG. CO.

"The House of Dependability"

3308-26 South Cicero Avenue, Cicero, Illinois

Stock and Representatives: Buffalo, N. Y. Elmira, N. Y. Worcester, Mass. Reading, Pa. Newark, N. J. St. Louis, Mo. New Orleans, La. Houston, Tex. Chattanooga, Tenn. Minneapolis, Minn.

TO SAVE GRINDING TIME

They are cut Flush

...WITH AN AIRCO TORCH

Riser heads can be cut so close to the surface of a casting that grinding is greatly reduced—when an Airco Gas Cutting Torch goes into action.

In riser cutting, speed and the ability to make close cuts even in hard-to-get-at places are the most notable features of the oxyacetylene flame.

However, it is the great versatility of the oxyacetylene flame that is the outstanding advantage of this modern production tool. It readily and accurately slices through steel . . . hardens it to an accurately controllable depth . . . gouges out defective welds . . . rids metal surfaces of undesirable mill scale.

Air Reduction's wartime policy is to help American industry do the tough job we all face. Our nation-wide field engineering service and our research facilities on any problem involving the oxyacetylene flame and the electric arc are at your disposal.

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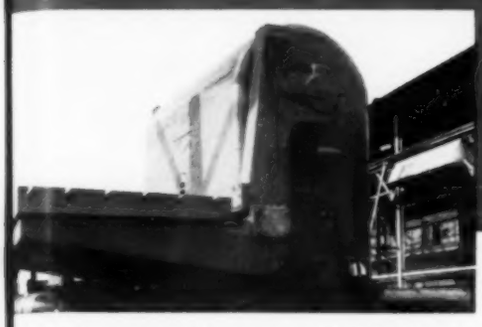
AIRCO WILSON

IDLE CYLINDERS ARE PRODUCTION SLACKERS: *Keep 'em rolling for victory!*

96 Molds in 9 Hours

3,000 TO 10,000 POUNDS



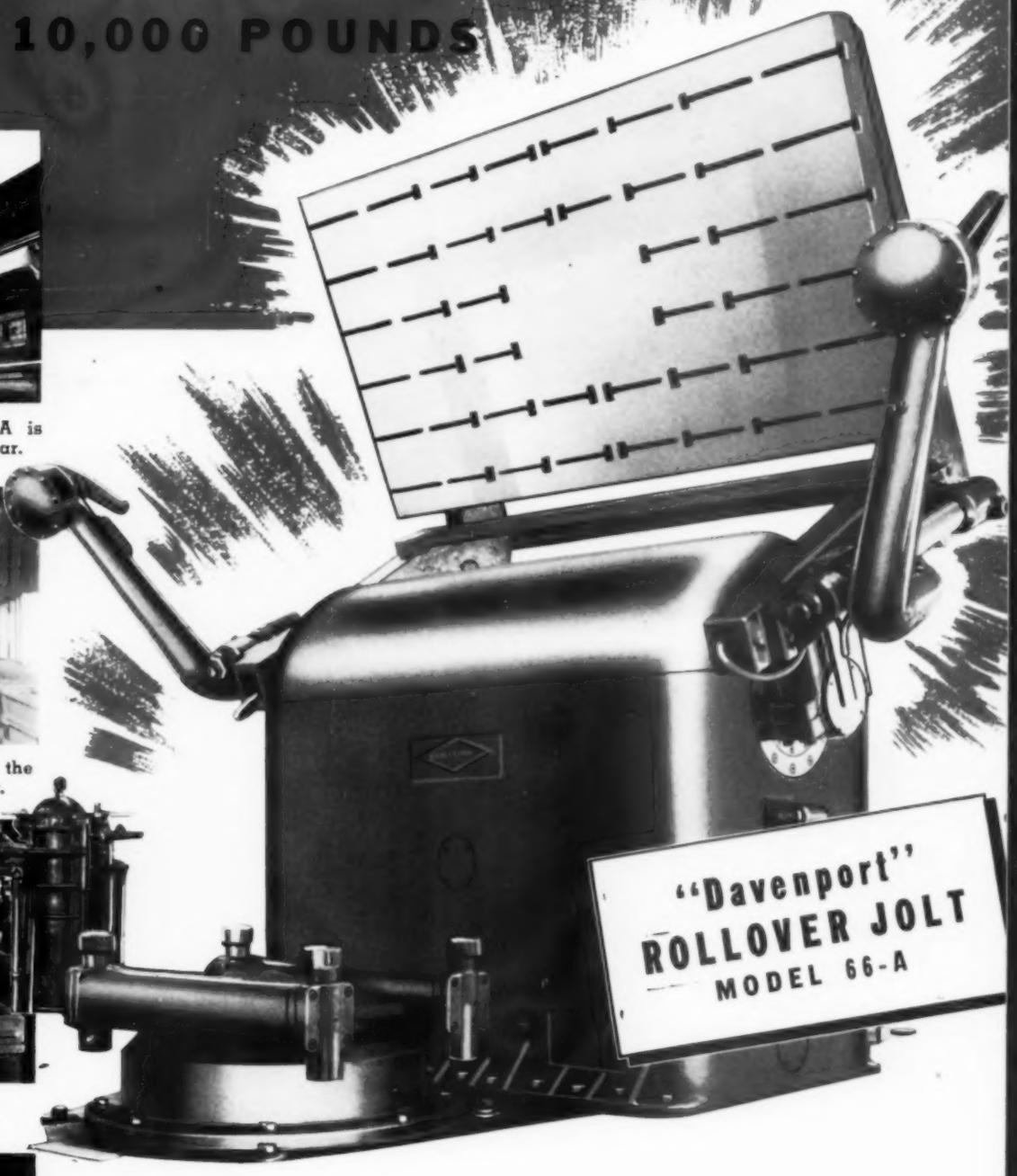
Powerful construction of a Model 66-A is own as it is being unloaded from flat car.

Entire center bay of foundry is used for the ds made from this one machine each day.

The floor ready for pouring.

Efficient jolting—simplified flask clamping. erful Rollover Model 66-A.

eady, accurate draw. 96 times per 9-hour each mold weighing 3,000 to 10,000 pounds.



A Powerful Machine THAT PAYS DIVIDENDS

"DAVENPORT"
LINE OF MOLDING MACHINES

POWER JOLT ROLLOVER DRAWS
Model A (Six Sizes)
Capacity from 1,000 to 12,000 lbs.
Model SA (Seven Sizes)
Capacity from 750 to 12,000 lbs.

JOLT PIN LIFTERS
Six Sizes
Capacity from 1,000 to 10,000 lbs.

PLAIN JOLT MACHINES
Fourteen Sizes
Capacity from 200 to 25,000 lbs.

This Davenport Model 66-A Rollover jolt machine reports these astonishing results from its owner. In 9 hours, 96 half molds (48 drags and 48 copes) are made with fourteen pattern changes—each half mold weighing from 3000 to 10,000 pounds. As its owner says, "We are delighted with this machine and it is paying us dividends. It has surprised us how simple and efficiently our men are able to change over the patterns—your Model A is doing us a grand job."

In steel foundries, in gray iron foundries, in the non-ferrous metal foundries, Davenport molding machines are paying dividends.

Write today and let us tell you more about this outstanding line of foundry equipment.

DAVENPORT MACHINE & FOUNDRY

DAVENPORT, IOWA, U. S. A.

Use **Adams Steel Jackets** *for perfect mold protection!*

THE "ADAMS" LINE OF FOUNDRY PRODUCTION ITEMS INCLUDES:

JOLT-SQUEEZE-MOLDING MACHINES
Side Rod Type and Post Type

JOLT-SQUEEZE-PATTERN-DRAW

MOLDING MACHINES
Side Rod Type and Post Type

HAND OPERATED SQUEEZERS

SNAP FLASKS—SLIP FLASKS

JACKETS, CAST IRON AND STEEL

BANDS, STEEL—MATCH FRAMES

PRESSER BOARDS—BOTTOM PLATES

VIBRATORS—TUBULAR SPRUE CUTTERS

Adams Cast Iron Jacket

The superiority of the Adams Steel Jacket lies in its patented construction. The angle reinforcements on sides and ends are die formed to pass over the corner angles, extended to overlap at the corners, and electrically spot welded on all contacting surfaces.

This construction assures greatest rigidity at the corners, where it is most essential, and thereby provides insurance against damage or distortion while in service.

Adams Steel Jackets are available in any length, width or depth, with straight sides or any desired taper. If you prefer Cast Iron Jackets, we have them also.

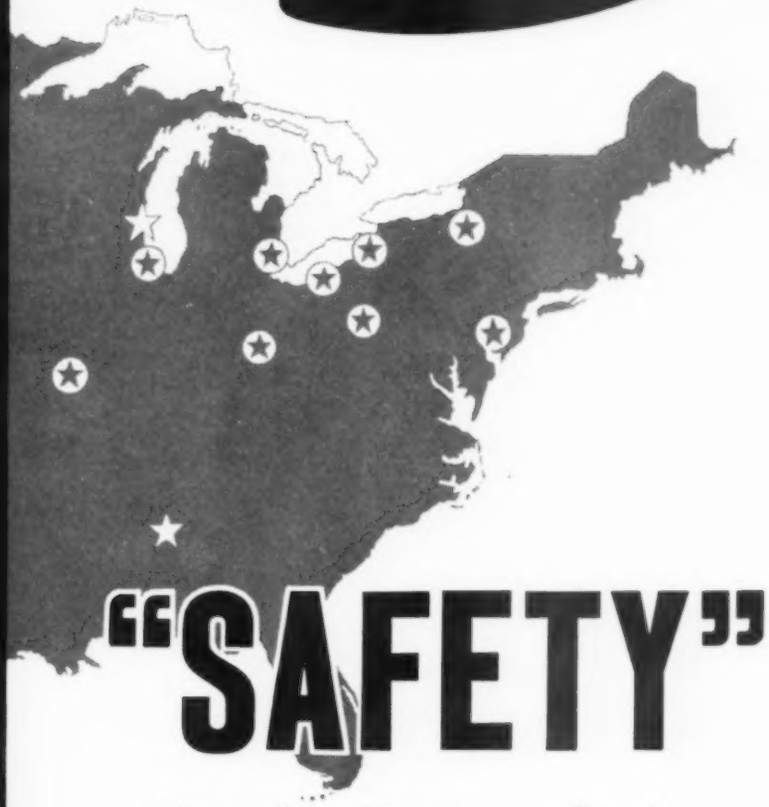
The Adams Company

1883 — Our 59th Year — 1942

800 Foster St., Dubuque, Iowa

MOLDING MACHINES **ADAMS** **FLASK EQUIPMENT**

TO SPEED DELIVERY OF
"SAFETY" GRINDING WHEELS



"SAFETY"

Again Expands Its Field Organization

LEGEND

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H. G. Mouat
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✪ *Chicago, Ill.*
Paul Bucheister
c/o Scully Steel Products, Co.
1319 Wabansia Ave.
Tel. BRUnswick 2000

✪ *Cleveland, Ohio*
E. R. Parker
1845 East 93rd St.
Tel. CEdar 9292

✪ *Detroit, Mich.*
D. R. Stewart
J. H. Nelson
12853 Hamilton
Tel. TOwnsend 8-4740

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✪ *Philadelphia, Pa.*
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Terminal Commerce Bldg.
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✪ *Springfield, Ohio*
Safety Grinding Wheel & Machine Co.
2258 Columbus Ave.
Tel. 4651

✪ *St. Louis, Mo.*
Tool Box Sales Co.
2220 Olive St.
Tel. CEntral 3787

✪ *Syracuse, N. Y.*
King Storage Warehouse, Inc.
Tel. 2-2191

★ *Milwaukee, Wisc.*
L. R. Fedler
5805 Wisconsin Ave.
Tel. BLuemound 0742

Now in nine major distributing centers, "Safety" warehouses have "SAFETY" *Grinding Wheels* on their shelves — to bring stock wheels to you faster when you need them.

Now in eleven key vantage points, there are "Safety" sales engineers at your call to help you with your particular grinding problems as they arise in your war-production.

Back of these men and sources of supply are "Safety's" modern factory and research laboratories equipped to bring you "the *right wheels, when* and *where* you want them." To insure prompt, dependable service, get in touch with the "Safety" warehouse or sales office nearest you. Let "SAFETY" fill your requirements *promptly.*

"REMEMBER PEARL HARBOR"

SAFETY

THE SAFETY GRINDING WHEEL & MACHINE CO.

SPRINGFIELD, OHIO

ESTABLISHED 1891

. . . and the Army and Navy, too!

WE cheered their heroism, their daring, their never-say-die spirit at Wake Island, for example.

Over and over in conversation, editorials, speeches, and every other form of verbal bouquet we told them how fine we thought they were. And how solidly we stood behind them.

But now comes the time when we've got to tell all that to the Marines and the Army and Navy in something more substantial than mere words.

Demonstration—not conversation—is called for now!

We've got to increase and maintain the club-houses which the men can use on their time off. 432 are already operating now. But that's not nearly enough.

We've got to help keep up their spirit by keeping boredom and monotony out of their lives. A fighter needs entertainment for his mind as well as guns for his hands, uniforms for his back, food for his stomach.

The USO camp shows are bringing the world's best entertainment to the armed forces. But we've only started!

Mobile units for troops in remote positions . . . troops-in-transit service at transportation stations . . . book gathering and distributing . . . these are just a few more expanding services the U S O is giving.

For the U S O—and you—are charged with the vital duty of helping keep up morale.

Fighting spirit is a real, a vital, a specific thing. An instrument of war like bullets, bombers, and tanks. Without it no victory can be won.

So it's your move now, Mr. and Mrs. America. That fountain pen you sign your check with is a machine gun today. Will you *start shooting?*

Send your contribution to your local campaign chairman or to National Headquarters, USO, Empire State Bldg., New York City.

★ USO ★

You wouldn't fit a Square Peg to a Round Hole

You wouldn't fit a square peg to a round hole—and you wouldn't put equipment into your foundry that, drawing a parallel, would be equally as ill fitting and ineffective in the operation of your business.

Now, more than ever, it is imperative that you coordinate the performance of all your departments to assure maximum production for our Victory Program. Herman Molding Machines, as part of a well planned molding department, have been known to increase mold production as much as 500%.

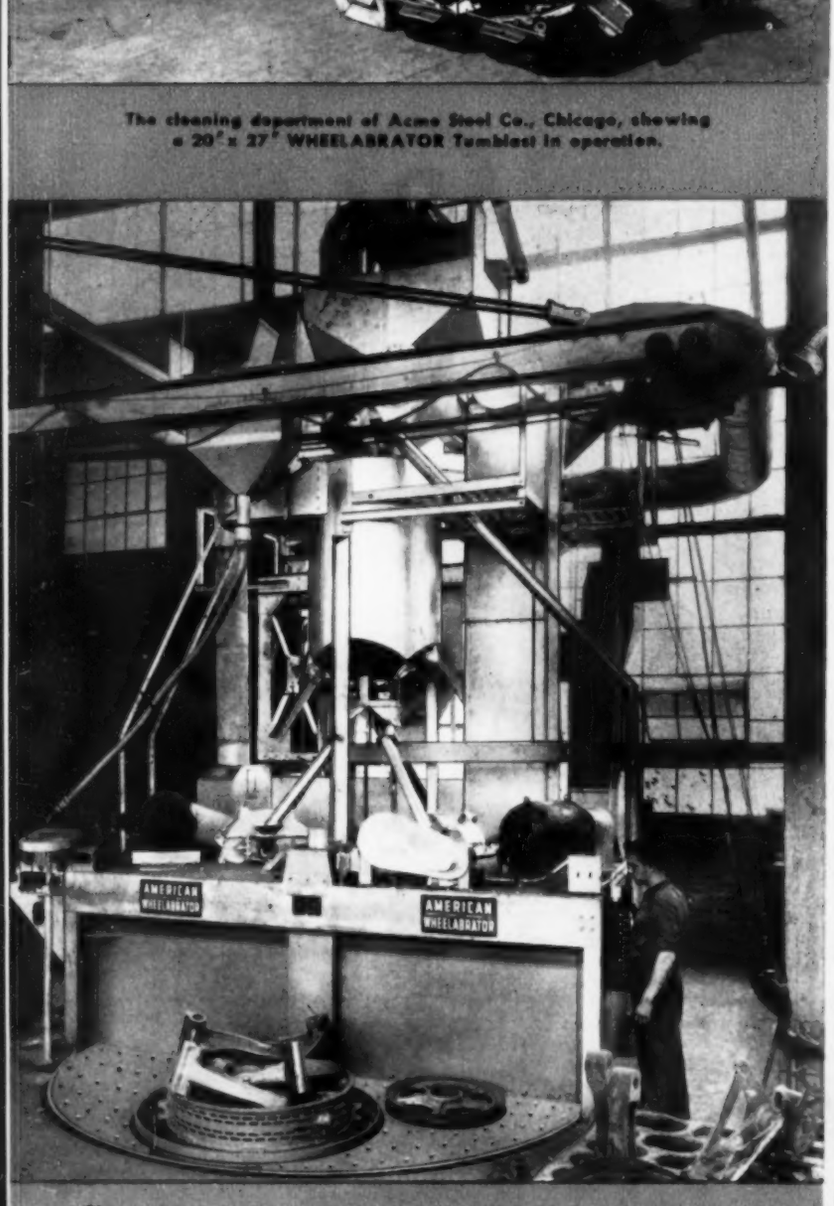
Exclusive Herman design features provide operating economies and increased speed to help fill urgent war order business rapidly and at low cost.

An experienced Herman foundry engineer will gladly help you with your molding problems without obligation.

MOLDING HERMAN MACHINES

HERMAN PNEUMATIC MACHINE CO. UNION BANK BUILDING PITTSBURGH PA

The cleaning department of Acme Steel Co., Chicago, showing a 20" x 27" WHEELABRATOR Tumblast in operation.



Cleaning large steel castings on a Special WHEELABRATOR Tablast at Unitcast Corp., Toledo, Ohio.

GET with

THESE brief reports of WHEELABRATOR performance in a number of typical foundry installations are indicative of what you can expect this modern speed-cleaning process to do for you.

The fact that nearly two thousand machines have been installed since 1933 shows how rapidly the transition to Wheelabrating is taking place, and clearly points to the outstanding job it is doing.

• • •

RELEASED TONNAGE FOR WAR PRODUCTION

"We have a unit in each of our three plants, a WHEELABRATOR Tumblast at Milwaukee Steel Fdry. Div., and at Liberty Foundry Div. and a Special WHEELABRATOR Cabinet with three wheels at the Spring City Foundry Div. Most of last year's production of nearly 20,000 tons of castings went through these machines with a decided improvement over our former methods in quality and with substantial savings in labor. They relieved the bottleneck in our production, which released substantial tonnages for war production which would not have been possible otherwise."

—Grede Foundries, Inc.

TRADE MARK

THE AMERICAN MOLDER

REG. U. S. PAT. OFF.

RESULTS *like these*
WHEELABRATOR
AIRLESS ABRASIVE BLASTING

OPERATING TIME REDUCED 8 HOURS

35 machine gun bases, each weighing approximately 22 pounds, are cleaned in eighteen minutes in a 36″ x 42″ WHEELABRATOR at General Railway Switch Co., Rochester, N. Y. Other work cleaned consists of miscellaneous steel castings, cable pulleys, drill tables, signal mounts, etc. Whereas 24 hours were previously required to clean their production with air blast equipment, only two 8-hour shifts are needed now with the WHEELABRATOR Tumblast.

CLEANING PRODUCTION DOUBLED

The 27″ x 36″ WHEELABRATOR Tumblast at the Jefferson Brass Foundry Co., Brooklyn, N. Y., cleans a load of small brass castings in only 2 to 3 minutes. Each load consists of about double the amount previously handled in a tumbling barrel, wherein the cleaning time was twenty to forty minutes.

SAVES $2.40 PER TON

Over 30,000,000 lbs. of gray iron castings have been cleaned since 1937 in a 48″ x 48″ WHEELABRATOR Tumblast and a 36″ x 42″ WHEELABRATOR Tumblast at New York Air Brake Co., Watertown, N. Y. Prior to this time all of the medium sized (10 to 70 lbs.) production castings were cleaned in sand blast barrels at a cost of $3.96 per ton.

With WHEELABRATOR equipment the same type and size work is cleaned for $1.56 a ton—making a saving of $2.40 per ton cleaned. Besides this saving, the Tumblasts produce cleaner castings which not only look better but are cheaper to machine.

HOW'S THIS FOR HEAVY PRODUCTION?

Forty to fifty tons of green and annealed steel castings, including the gates and risers on the green castings, are cleaned in fifteen hours on the Special WHEELABRATOR Tablast (using two 60″ diameter tables) at Unitcast Corp., Toledo, Ohio. The largest casting cleaned is 60″ in diameter, 36″ high and weighs 3,000 pounds.

A typical month's production of more than 1025 tons of miscellaneous castings are being cleaned with this machine—a volume that formerly required three sand blast rooms.

INSPECTION SIMPLIFIED

St. Louis Steel Castings Co., St. Louis, Mo., cleans steel castings ranging in weight from less than a pound to over 720 pounds apiece in a 48″ x 48″ WHEELABRATOR Tumblast. The castings are cleaned once in the rough directly from the shakeout and again after normalizing for final cleaning.

Cleaning time has been standardized to 5 minutes for the rough cleaning and 10 minutes for the annealed castings. The final WHEELABRATING gives the castings a smooth, silvery finish, free from scale, and makes inspection a simple process.

TOOL LIFE INCREASED 300%

In addition to reducing cleaning time and improving the appearance of their work, the Blackmer Pump Co., Grand Rapids, Michigan, discovered the 36″ x 42″ WHEELABRATOR Tumblast was cleaning their products so thoroughly that tool life on certain jobs had increased 300%.

BREAKAGE ELIMINATED

The Milwaukee Malleable & Gray Iron Works are Wheelabrating practically one hundred percent of hard iron castings with no breakage. They have three WHEELABRATOR Tumblasts in daily operation cleaning malleable and hard iron castings.

SPACE SAVED

By replacing 14 old style tumbling barrels with a 36″ x 42″ WHEELABRATOR Tumblast, Beatty Bros., Limited, Fergus, Ontario, Canada, were able to use the space saved to rearrange their overcrowded production departments.

WHEELABRATOR *Speed Cleaning* IS HELPING SPEED THE DAY OF *VICTORY*

AMERICAN
FOUNDRY EQUIPMENT CO.

505 SOUTH BYRKIT STREET · MISHAWAKA, INDIANA

TWO VALUABLE AIDS

TO *Wartime Production*

ONE: The Republic Pig Iron Metallurgist

Here is a man who can show you how to get every possible pound of finished castings out of your foundry. He is an experienced metallurgist—a technical man who knows from years of "shirt-sleeve" work in all kinds of foundries what iron can do and what it cannot do. He knows how it behaves—also why it sometimes misbehaves, and what to do about it. He's just the man to show you how to step up vitally-needed wartime production.

TWO: Republic Chateaugay Pig Iron

When castings are intricate in design—must be close-grained—must possess hard wearing surfaces—must resist heat or acids—must machine freely and uniformly . . . or when no other iron will perform satisfactorily under difficult conditions . . . the answer is Chateaugay.

This iron is made from a magnetite ore—the purest known in the world—free from copper, chromium and arsenic and extremely low in phosphorus and sulphur.

Use both these aids to better, faster production. Tell us when you'd like a metallurgist to call. He'll study your problems and facilities. He'll offer suggestions. And he can tell you the full story about Chateaugay.

REPUBLIC STEEL CORPORATION

General Offices: Cleveland, Ohio

Berger Manufacturing Division • Culvert Division
Niles Steel Products Division • Steel and Tubes Division
Union Drawn Steel Division • Truscon Steel Company
Export Department: Chrysler Bldg., New York, New York

Republic

PIG IRON

ALSO TRUSCON FOUNDRY FLASKS • REPUBLIC CORE WIRE • FOUNDRY NAILS

"CHATEAUGAY"
Low-Phosphorus, Copper-Free

"REPUBLIC"
(Northern)
Foundry, Basic and Malleable

"PIONEER"
(Southern)
Foundry and Basic

Gray Iron Foundries Make Progress In Solving War Problems

THE gray iron branch of the foundry industry, that giant composed of over 3000 individual plants having a combined annual melting capacity of approximately 18,000,000 tons of iron, at last seems to be awakening to the value of its potentialities. Through the increased initiative of management, both co-operative and individual effort recently has been directed toward educating various engineering and procurement agencies of the government on the availability of gray cast iron for the American war effort and the maintenance of essential civilian supply. Results can be measured best in the way the great majority of gray iron foundries have succeeded in solving many of the problems created by recent restrictive orders of the War Production Board.

After one month of operation under the amendment to Preference Order No. M-21, which eliminated delivery of all B iron to foundries and restricted deliveries of castings to orders carrying ratings of A-10 or better, casualties do not appear to be as great as previously were anticipated. While it is true that a number of plants either have closed down or have had to reduce operations materially, the total gray iron capacity affected by this situation has been held at a low point, due to the ability of many plants to convert facilities to the production of castings which carry suitable preference ratings. A few gray iron foundries have installed sufficient equipment to pour steel castings made in either the electric furnace or the converter, or both. Other companies, whose plants included some crane equipment, have been able to adapt facilities and train personnel to produce castings for machine tool builders and similar use.

The squeeze resulting from priority restrictions on delivery of castings has been confined almost entirely to light gray iron shops and to those captive foundries supplying castings used in the construction of consumer articles which now have been banned. Among the organizations hit hardest are those producing materials for the building trades, such as sanitary ware, furnaces, radiators, stoves, sashweights, etc. Foundries producing heavy gray iron castings continue to operate practically at capacity, due to the tremendous war demand for that product.

What are the probable trends for the immediate future in the light gray iron field? Undoubtedly progress of the war and shortages of materials and processes will result in an increased demand for gray iron castings. While events of the last war should not be taken as a guide, it is interesting to note that the need for castings increased greatly in the second year of that conflict. Captive shops are continuing to follow two courses. Some are invading the jobbing field in an effort to obtain apparent war business, and in so doing are adding somewhat to the confusion. In other cases, manufacturing concerns operating foundries are endeavoring to convert the entire establishment to war production, and anticipate the need for castings in this work will be sufficient to keep their foundries operating.

Further possibility of converting gray iron capacity to the production of steel castings depends upon the increase in demand for cast steel. With WPB policy tending toward restriction of new construction, this type of conversion may be given greater attention. Recently the WPB has been considering the possibility of converting certain types of captive gray iron shops producing light castings to the production of aluminum and magnesium castings for war. Availability of buildings and practically all equipment, with the exception of melting units and heat treating furnaces, provides an important factor in that type of conversion. Due to shortages of vital raw materials, numerous nonferrous castings may be replaced with iron for the duration.

While production of light gray iron may continue downward, the intelligent effort now being directed toward the field should reverse this trend shortly.

From the standpoint of co-operative effort, the producers of gray iron are in the best position in history. Membership in the Gray Iron Founders' Society has passed the 500 mark and the organization continues to grow. Courageous leadership of officers and directors, coupled with an intelligent and devoted staff in both Washington and Cleveland, have provided the background for tremendous service, not only to members of the society but to the entire gray iron castings field. The society, as it increases in size, is rendering great assistance in the war effort, and undoubtedly will be the source of much needed leadership in the highly competitive days that must come with peace.

Frank G. Steinebach

Editor

NAVY MAKES VARIETY OF NONFERROUS CASTINGS

DIGNIFIED and silent in times of peace the United States Navy carries on quietly and efficiently. Dignified and silent, but with doubled fists, jaws hard set and caps pulled down over narrowed eyes, the navy carries on with, if possible, greater efficiency when war clouds menace: when the bugles blow to quarters and the great guns are brought into action.

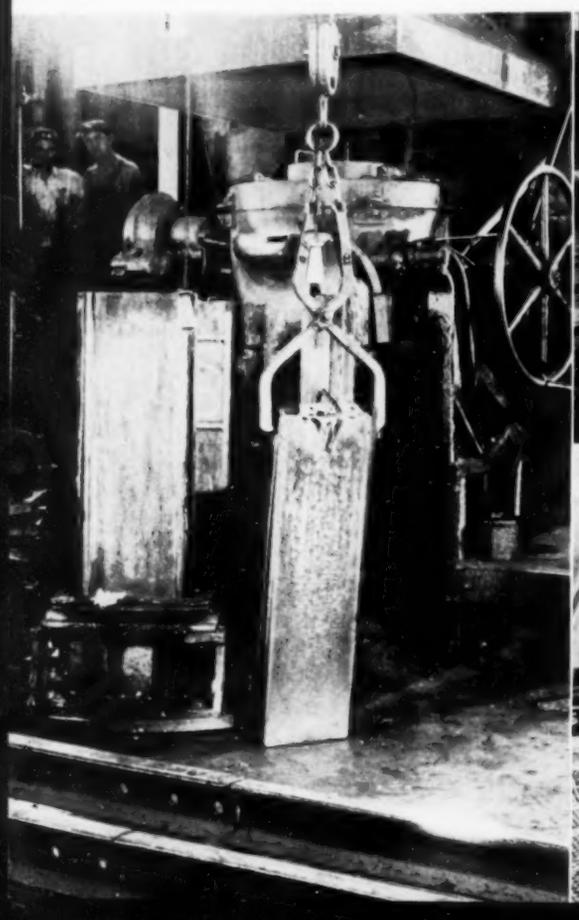
On the score of silence perhaps an exception should be made for one division of the naval service, to wit, the amphibious leather neck sons of Mars, the United States Marines. They have never established a reputation for silence either afloat or ashore. With characteristic naivete they are willing to admit modestly to one and all that their flag is flown in every breeze from dawn to setting sun. They do not hesitate to direct attention to the fact that they have been in every clime and place where men could drag a gun. They cheerfully ignore the rather obvious fact that the navy carries them, guns and all, from the halls of Montezuma to the shores of Tripoli—and also brings them back.

In addition to efficiency the navy's well known reputation for spic and span appearance, for maintaining everything ship shape and Bristol fashion, whether afloat or ashore, is upheld to a remarkable extent even in the foundries controlled by the Navy Department.

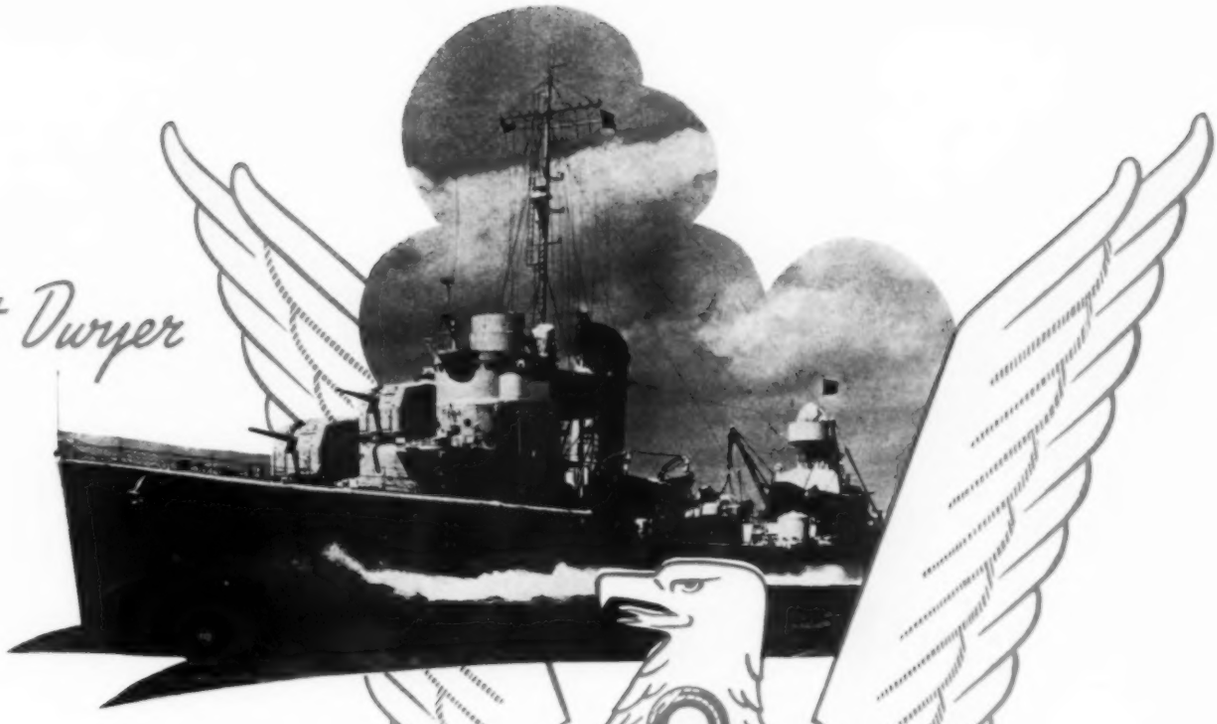
This feature was touched upon in a preceding article dealing with the steel foundry, which appeared in the June issue of THE FOUNDRY. In the adjoining nonferrrous foundry where operations are not conducted on quite as large a scale as in the steel foundry, the same navy neatness and order prevail.

Navy Yard Foundry Clean and Tidy

Naturally the floor is not as smooth and shiny as the holy stoned deck of a battle ship. The tools and other equipment are not polished to the same degree of perfection as the brass work on the Admiral's barge, or the barrels of the great steel guns haughtily and grimly pointing to and beyond the far horizon. The rammers and shovels do not gleam as brightly as the rifles on parade, but they are handled just as skillfully in the daily routine of producing castings that make parades possible in the blessed days of peace and in the grimmer evolutions of personnel and equipment (*Please turn to page* 168)

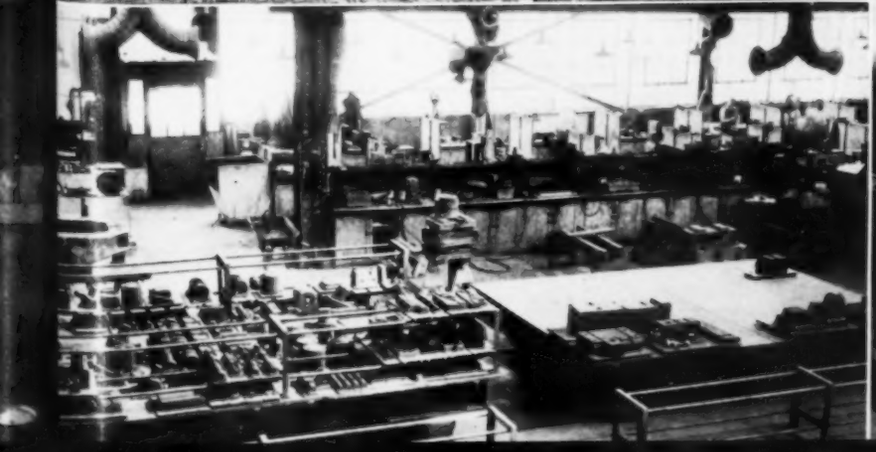


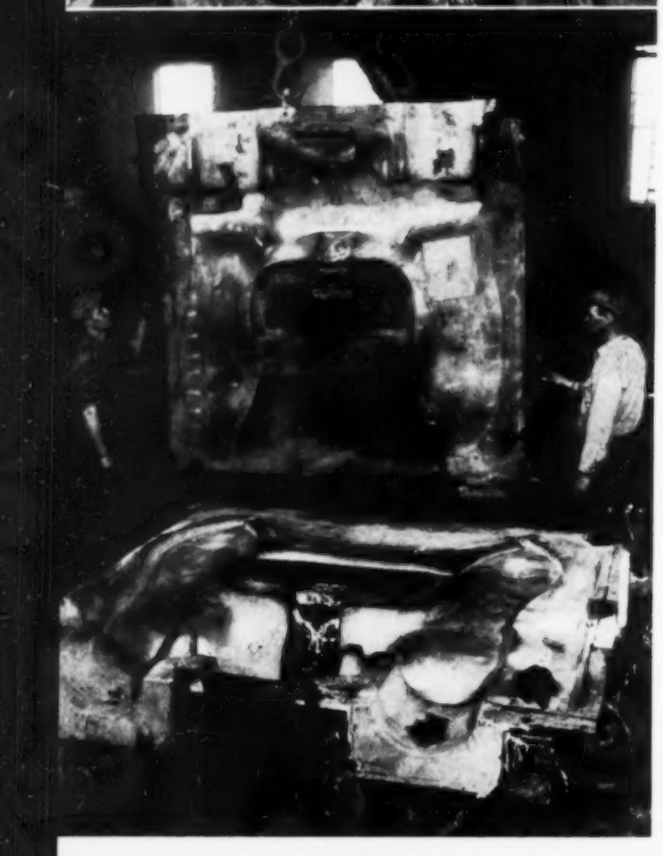
By Pat Dwyer



SHIPS FOR VICTORY

Fig. 1 (Far left)—Slabs for cartridge brass are cast in ingot molds from metal melted in electric furnaces. Fig. 2 (Top left)—Small section of the cleaning and inspection room. Fig. 3 (Bottom left)—One of two batteries of pit type, coal fired crucible furnaces arranged in a semicircle and connected to a common stack on the outside of the building. Fig. 4 (Below)—Crucibles are transported on a low wheel guarded truck. Fig. 5 (Bottom)—Cores are loaded on large flat top cars and dried in gas fired ovens. Fig. 6 (Right below)—Aluminum castings are loaded on a three-shelf circular rack for handling in and out of the annealing furnaces





CASTS STEEL *Anchors* VERTICALLY

By WILLIAM BELL JR.

CONSIDERING the whole hearted and universal manner in which Canada is devoting every effort and every manufacturing facility to the production of practically everything needed in the prosecution of the war, one is moved by association of ideas to recall snatches of the Marine ditty which modestly directs attention to the fact that these gentlemen get around. "Our flag has flown in every breeze from dawn to setting sun. We've fought in every clime and place where men could drag a gun."

Canada is building ships in nearly every place on the Great Lakes, on the Atlantic and Pacific sea board where there is enough water to float them. Up to the present and dating back to the days of the earliest and daring sea rovers, this necessity of water in the ship building program, has been more or less of a limiting factor. Recently occasional hints would seem to indicate that in the not too distant future, ships in sections may be fabricated far inland, carried to the water side and assembled. In the meantime fittings and equipment, the myriad items necessary for the functioning of a sea worthy vessel, are produced in ever increasing quantity in nearly every plant between the two oceans.

Ship and other castings are made at the Vulcan Iron Works, Ltd., Winnipeg, Manitoba, claimed to be the largest iron and steel foundry in the prairie Provinces. The city, midway in Canada and approximately 1500 miles from where the Atlantic surges beat up on the East coast and the Pacific rolls in on the West, has a population of 300,000 and apparently is destined in the future to rival Montreal and Toronto. The seed for this hustling, progressive and modern city was dropped when a representative of The Governor and Company of Merchants-Adventurers (*Please turn to page* 161)

Fig. 1 (Top left)—Anchor fluke as withdrawn from sand showing gating and heading. Fig. 2 (Below)—Drag mold. Fig. 3 (Center left)—Mold open with cope suspended, showing heading and gating. Fig. 4 (Below)—Finished anchor complete with fluke, stem, clevis and pin

HANDLING CASTINGS
Through the Cleaning Room

By J. M. MUNROE

IN A general rearrangement program to improve efficiency in the cleaning department of one of the gray iron foundries operated by the General Electric Co., and to meet increased production demands from 150 to 350 tons per week, it was necessary to modernize material handling methods. Speed up created by previously installed conveyor systems for molding, pouring and shakeout (*Please turn to page* 171)

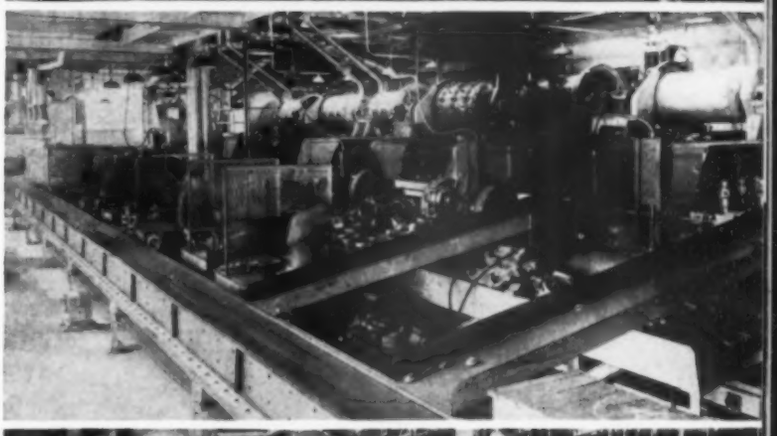


Fig. 1 (Top)—Fork truck about to deliver castings from shakeout to cooling room in steel box which can be stacked to allow more floor space. Fig. 2 (Above)—Delivering castings to manufacturing department. Fig. 3 (Below)—After drying the castings are transported to scales. Fig. 4 (Upper left)—Castings are delivered in same boxes from cooling room to tumbling barrel platforms. Castings are emptied from barrels into chutes leading to grinders and chippers. Fig. 5 (Left center)—Grinders and chippers place castings on conveyor which carries them to inspectors. Fig. 6 (Left)—From inspection conveyor takes castings through paint dip and oven dryer. Fig. 7 (Left below)—Castings are loaded on trailer by fork truck for shipment

PROTECTING

LIFE, PROPERTY, AND PRODUCTION

In the Foundry Industry During the War—Part III

Code of Recommended Practices Developed by the Industrial Hygiene Codes Committee of the American Foundrymen's Association

Reviewed and Passed by the Office of Civilian Defense

SECTION IX—PROTECTION REQUIRED FOR BLACKOUTS AND BOMB RAIDS

(A)—*Limitation.* As stated in Section IV, these recommended practices and admonitions for protection of industrial establishments are not intended for actual war zones. It is recognized that there are great possibilities of enemy air raids performed probably by suicide squadrons in an attempt to destroy military and industrial objectives as well as reduce the morale of the people. Industry should therefore co-operate to the fullest extent with a view of preparing properties for eventualities of blackouts and air bomb raids. Within 300 miles of all coastlines the plants should be ready for any eventuality and the employes organized, trained and ready. Further inland the plants should be prepared and employes organized and trained. All plants should keep informed of the latest requirements of the Army, Navy and the Office of Civilian Defense.

(B)—*Theory for Recommendations.*

(1) *Operating Shifts.* Industrial plants operate one, two or three working shifts in a 24-hour day. Those plants that operate multiple shifts, viz., two or three shifts, naturally operate part-time during the night hours of the 24-hour day so that illumination within the plant is necessary for the conduct of the business.

Even plants that operate only one shift per day still have a minimum of illumination as a rule on account of watch service, boiler and engine rooms, or operations or processes that must be kept going 24 hours a day.

All of these suppositions simply mean that a part or all of the plant is lighted during the night hours and therefore in case of a blackout, proper methods must be employed for complying immediately with warning signal so that no light is visible to the outside that would be visible to the enemy.

(2) *Type of Construction.* The modern plant is usually a one-story affair with no basement. The older manufacturing buildings are of multiple-story mill constructed type and very few are of reinforced con-

crete or structural steel and concrete type of construction.

One-story and mill constructed buildings may not resist an aerial bomb; hence there is no safe place to remove the employes in the event of a raid but that portion of the building which is considered safest should be designated as a shelter area. Basements may be considered as shelter for employes if there are at least two exits and is considered to be the safest area. Concentrations of employes should be avoided.

Bomb shelters of the type that have been used in Europe with about a 6-foot 6-inch reinforced concrete roof are very expensive to build and even with such thickness of roof they may not be safe against the latest types of bombs.

(3) *Continuous Operations.* It appears that the best interests of industry would be served if plants would continue active operations during a blackout or actual bomb raid and thereby keep the personnel spread throughout the plant rather than try to concentrate the employes in a few spots. If a bomb were to hit a place in the plant where the employes were concentrated, the casualties would be high, but if the employes were kept at their regular tasks, they would be thinned out over the plant and in the event a bomb struck the casualties would be much less.

Another advantage in keeping the employes at their jobs is that morale would be much better due to their having something to keep them occupied.

It is therefore strongly recommended that employers adopt the policy of keeping the employes busy during an emergency, thereby reducing possible casualty lists, helping maintain morale, minimizing probabilities of sabotage from within during the confusion that would result from turning down the lights and concentrating the employes in a few spots, also keeping much needed production going all the time.

Certain employes should be designated as wardens, fire watchers, repair squads, etc., and they should take their defense posts upon the sounding of the alarm.

Consideration must be given to keeping the employes away from the windows and instructions given to take cover under any table, machinery and the like or behind stacked material.

(C)—*Blackout of Property.* Blackout of a property must be complete to be effective so that no light can be seen from above. To do this effectively either of three things must be done, viz.,

(1) Prepare buildings that are normally operated during the night hours so that they are perpetually blacked out (this by means of permanently covering the wall and roof openings) for the duration of the war.

(2) Provide low intensity emergency lighting that can be switched on and the regular illumination turned off.

(3) By any method of screening, hooding or controlling the intensity and direction of the visibility of the light to the outside.

In any case all outside lights and glare from metallurgical stacks and chimneys must be eliminated.

(D)—*Methods of Blacking Out Wall and Roof Openings.*

(1) *Resistance of Materials to Bomb Explosions.* When windows, skylights, louvers, doors and the like are to be covered with some material to temporarily or permanently blackout such openings, none of the cheaper expedients will resist bomb fragments. Even 1½ inch thick steel plate may not stop the penetration of bomb splinters. Some cheap expedients applied to such openings will minimize the splintering and reduce amount of glass flying into the buildings due to forces of the concussion from bomb explosions. The casualties from flying glass are high and it is recommended that a method be adopted that will minimize this effect.

(2) *Covering Glazed Areas.*

(a) *Temporary and Permanent Coverings.* The average factory building usually has glazed areas in (*Please turn to page* 151)

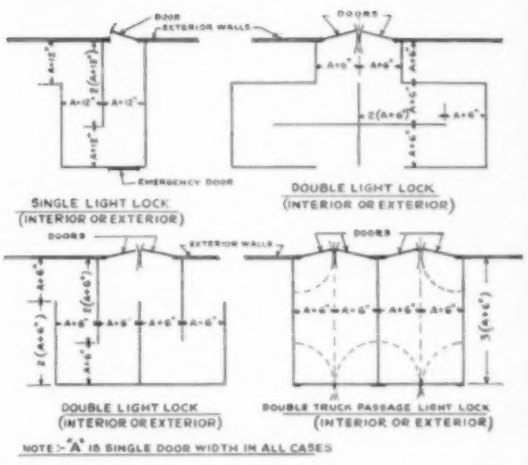

SINGLE LIGHT LOCK (INTERIOR OR EXTERIOR)
DOUBLE LIGHT LOCK (INTERIOR OR EXTERIOR)
DOUBLE LIGHT LOCK (INTERIOR OR EXTERIOR)
DOUBLE TRUCK PASSAGE LIGHT LOCK (INTERIOR OR EXTERIOR)
NOTE:-"A" IS SINGLE DOOR WIDTH IN ALL CASES
ALL LIGHT LOCKS ROOFED OVER WITH ALL SURFACES DULL BLACK AND NONREFLECTING. WHITE LINE (OVER 2" WIDE) PAINTED HORIZONTALLY ALONG WALLS (3'-6" ABOVE FLOOR). ALL INSIDE DIRECT LIGHT FROM ANY SOURCE OR REFLECTOR SHOULD BE SHIELDED FROM THE EXIT. DIMINISH INTENSITY OF INTERIOR LIGHTING IN THE VICINITY OF LIGHT LOCK.

FIG. 3

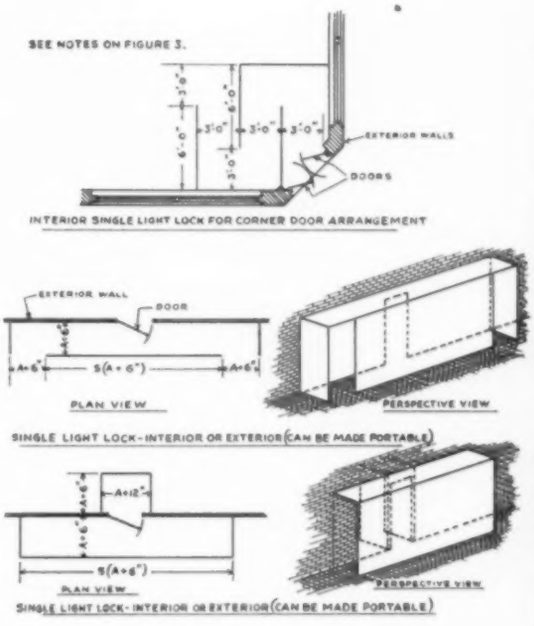

SEE NOTES ON FIGURE 3.
INTERIOR SINGLE LIGHT LOCK FOR CORNER DOOR ARRANGEMENT
PLAN VIEW
PERSPECTIVE VIEW
SINGLE LIGHT LOCK-INTERIOR OR EXTERIOR (CAN BE MADE PORTABLE)
PLAN VIEW
PERSPECTIVE VIEW
SINGLE LIGHT LOCK-INTERIOR OR EXTERIOR (CAN BE MADE PORTABLE)

FIG. 4

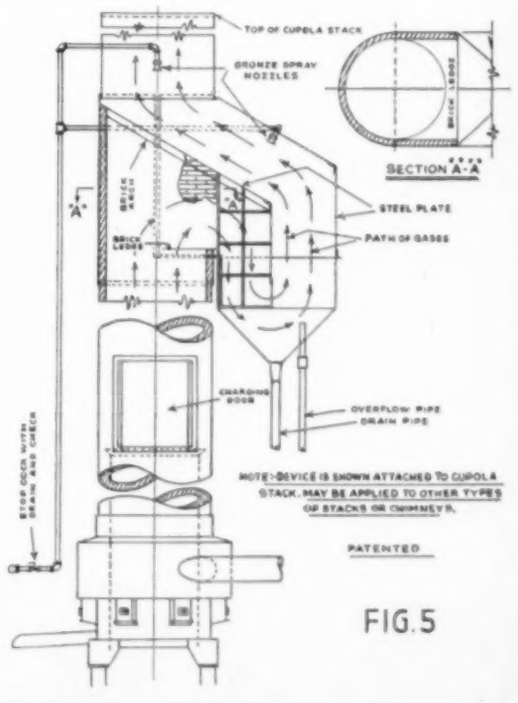


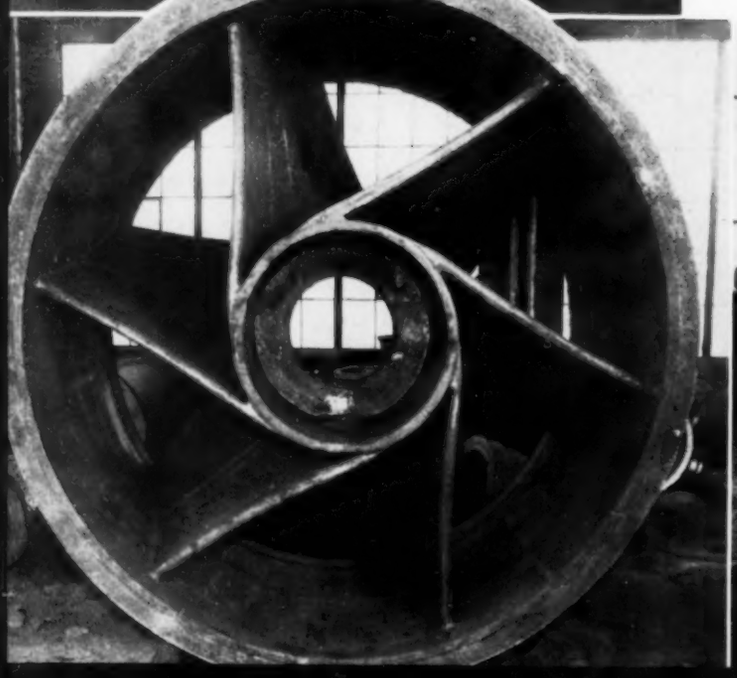
FIG. 5

MOLDING L

By PAT DWYER

IN ADDITION to a foundry in Lynchburg, Va., devoted to the manufacture of plow castings, pipe fittings and miscellaneous high grade medium weight castings, the Lynchburg Foundry Co., operates an extensive foundry plant in Radford, Va. This plant includes three gray iron foundries. Cast iron pipe in 12-foot lengths and from 30 to 60 inches diameter is made according to the pit method in one shop. The cast iron flasks lined with dried sand and with a loam core in the center, are set up in a deep circular pit served by a revolving hydraulic crane. The pits occupy space along one side of the shop.

Sand handling equipment, core ovens and core making stands occupy space on the opposite side. The molds rest on stools in the bottom of the pit. After the pattern is withdrawn, the mold is blacked and then dried by a gas or small coke fire under the stool. The method was developed many years ago and was regarded as standard in all pipe shops. In some instances the cranes were operated by steam. In a few installations the pits were longitudinal and



Figs. 1, 2 and 3 (Upper left)—In making the combination mold for the 26,000-pound diffuser shown in Figs. 4 and 5, the base is swept up to form the core, print and a shoulder seat around the perimeter. A single layer of brick is bedded in loam on the base and after sweeping up, a heavy iron ring is lowered into place. Then the brick wall forming the outside is built up, covered with loam, and swept up to the desired contour. The outside part of the mold then is lifted away and placed in the oven. Then the cores are set in position on the base as shown in Figs. 1 and 2. After the cores are in place, the outside of the mold is lowered into position as shown in Fig. 3. Top and side views of the diffuser are shown in Figs. 4 and 5 below. Fig. 6 (Right below)—Side view of a 38-ton casting. Fig. 7 (Right)—Pouring a heavy casting

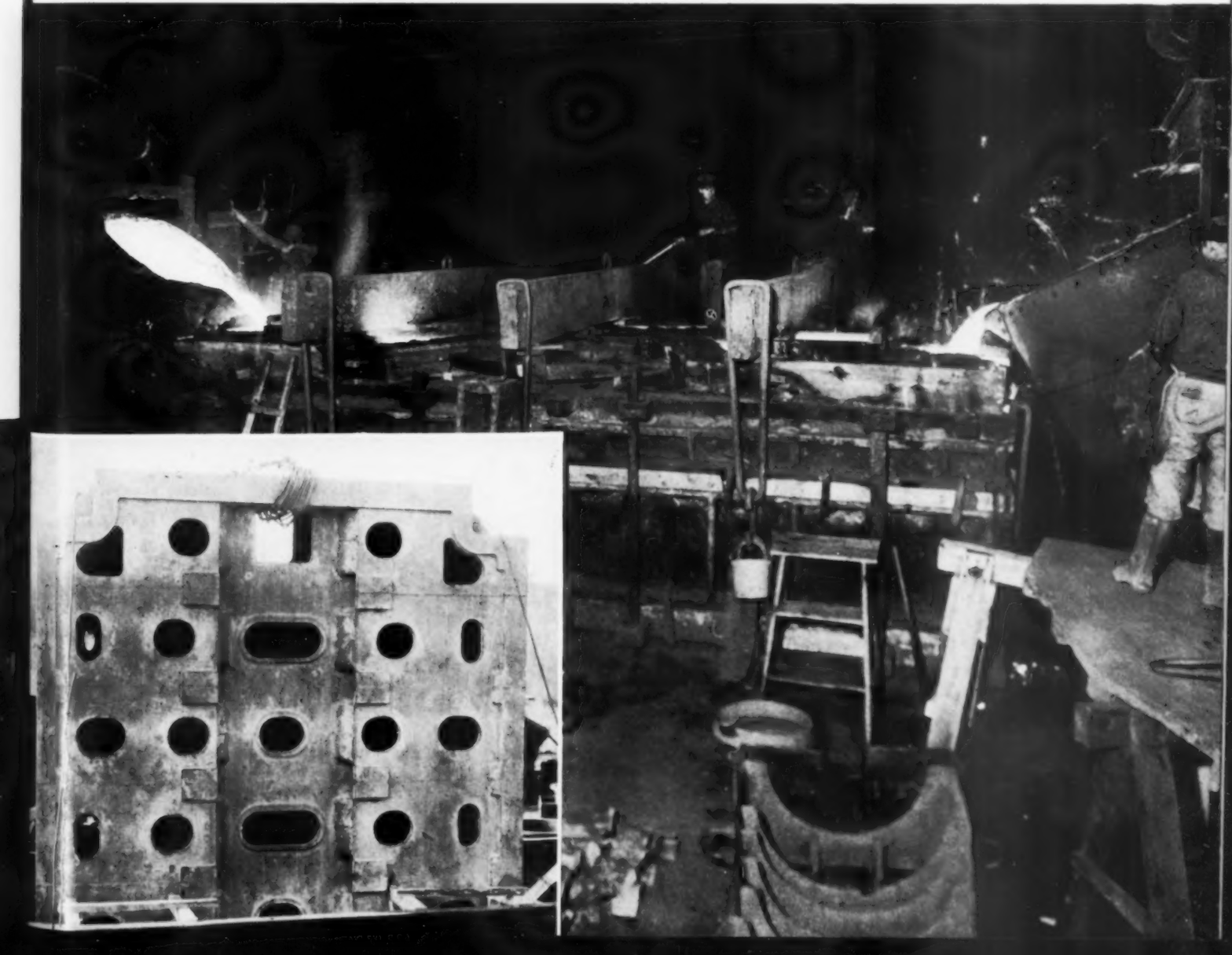
LARGE IRON CASTINGS

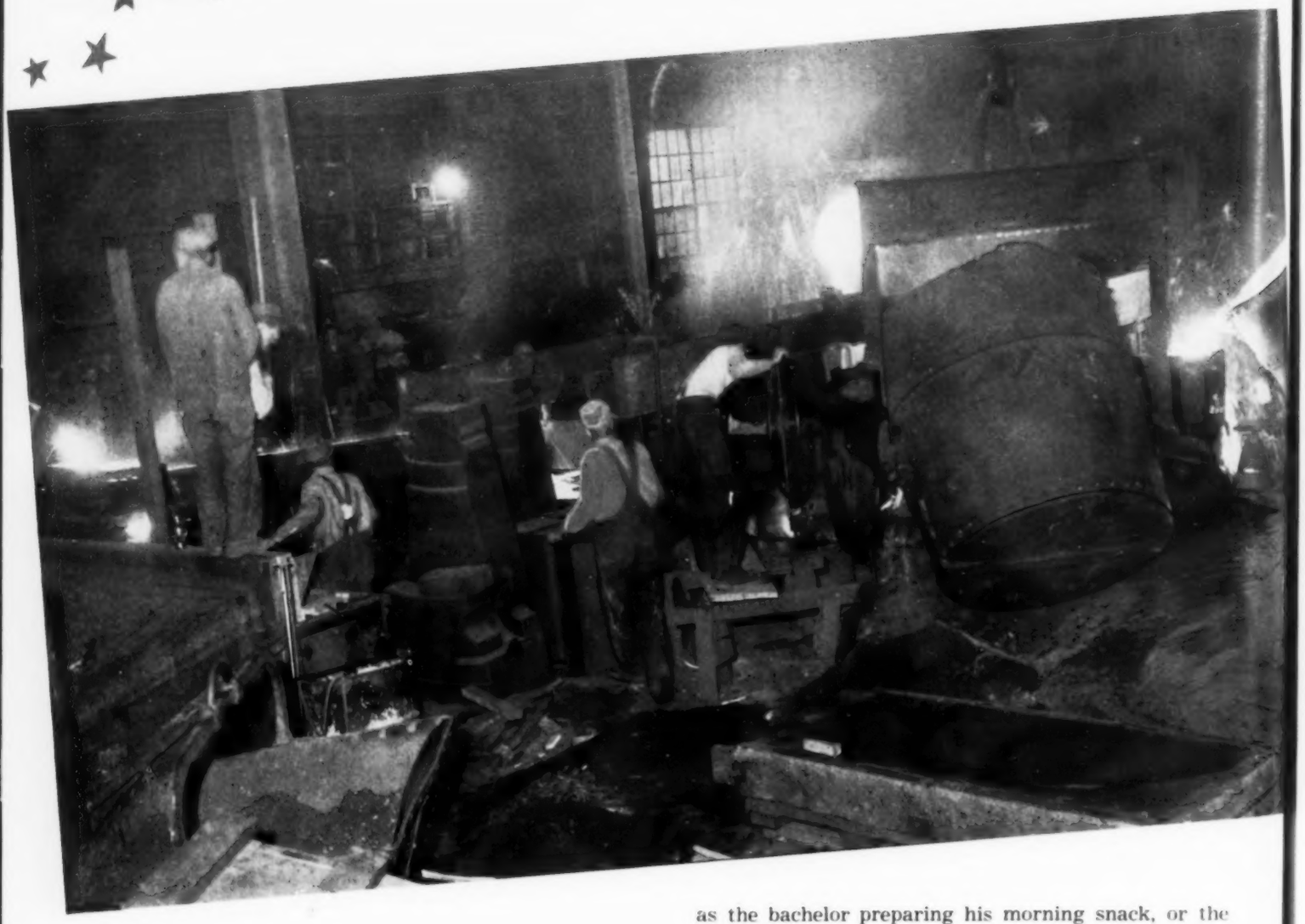
served by the regular type electric traveling crane.

In the second foundry cast iron pipes from 4 to 24 inches diameter and 18 feet in length are made according to the centrifugal process developed by de Lavaud and first introduced to the United States about 20 years ago. Molten iron is poured into a water cooled mold revolving horizontally at high speed. The speed varies with the diameter. In these pipes of the bell and spigot type, the bell end is formed by inserting a dry sand core in the lower end of the inclined mold. The casting solidifies almost instantly. It is extracted from the mold and rolled into an annealing furnace to anneal the slight skin chill imparted by the mold. They are held at 1710 degrees Fahr. for 15 minutes. Details of the process and equipment have been presented on several occasions in THE FOUNDRY.

The third foundry, a large brick, steel and glass building 100 x 600 feet, well lighted and ventilated has been extended on two occasions to cope with increasing orders for an almost infinite range of large, heavy castings for chemical plants, machine tool builders, shipyards and many other forms of industry. Under present war time conditions, description of many interesting molding and casting practices are not available for publication. Examples shown in the accompanying illustration indicate to some extent the scope and capacity of the foundry, the caliber of the executive staff and the undoubted skill and experience of the craftsmen, many of whom have been on the payroll from 20 to 30 years.

Practically the entire personnel is native born. An extensive apprenticeship system up to the present has been adequate to meet replacement and extension requirements. The city of Radford is situated in the mountains well over 1800 feet above sea level, which may or may not be the reason that colored men are not seen around the plant.





To the foundryman accustomed only to the production type of foundry where molds travel continuously and in orderly manner on long conveyor lines, or in many light work foundries where the molds are set out on the floor neatly and in mathematical exactitude between wide clean gangways, a heavy jobbing foundry presents a scene of wild disorder and indescribable confusion. Great pits yawn all over the floor, some empty in preparation for construction of molds and others with molds in various stages of progress and surrounded by mounds of sand, piles of brick, boxes of loam, binder bars, clamps, building plates and flask parts.

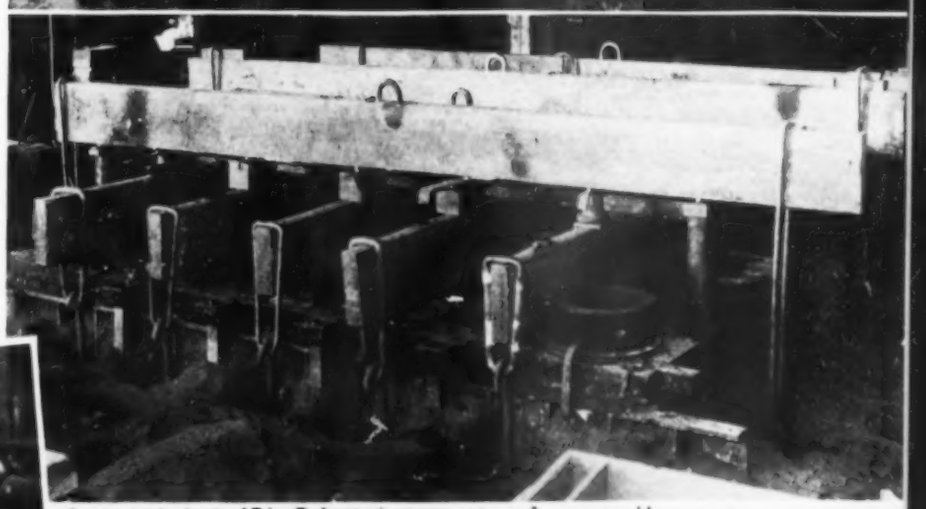
Great cranes rumble over head and swing loads with the greatest of ease and nonchalance, loads which even the redoubtable Superman would hesitate to tackle. Machine gun rattle of pneumatic rammers and chipping hammers, torn up floor area, mounds of material and miscellaneous equipment scattered promiscuously bring to mind a city after an earthquake, or after a squad of bombing planes has roared in from the sea, dropped their devastating loads and departed.

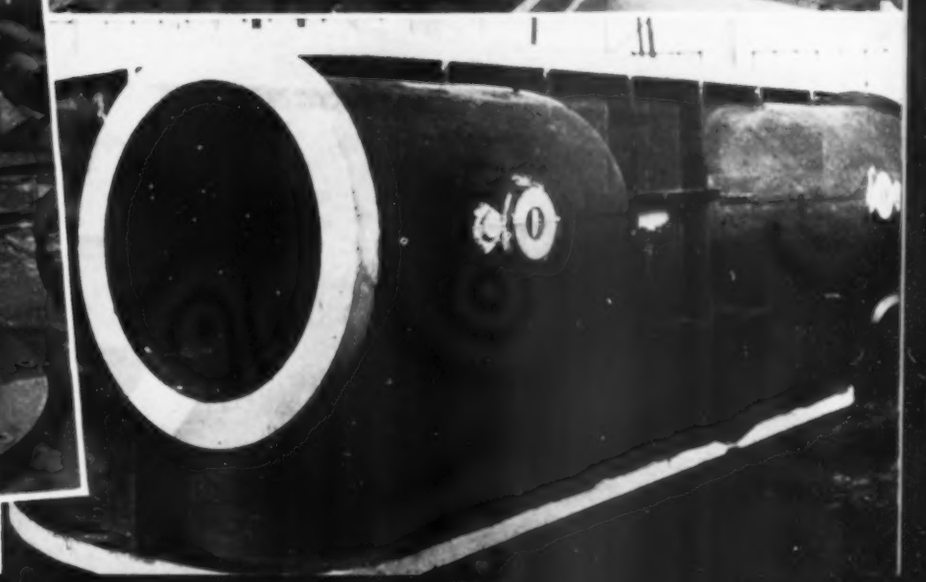
In this as in other situations everything depends on the point of view. Men connected with a shop of this kind either in executive or operating capacity see nothing strange or peculiar in the condition of the floor. Everything is normal and in perfect order. Highly skilled men concentrate on the job in hand and perform their allotted duties as calmly as the bachelor preparing his morning snack, or the professional cook smashing eggs to make an attractive omelet.

Three stages in the assembly of a combination dry sand and loam mold for a 26,000 pound diffuser casting are shown in Figs. 1, 2 and 3. Two views of the casting produced in the mold are shown in Figs. 4 and 5. Bottom, top and outside wall of the mold are swept in loam. Center and vane cores are made from a combination of beach and bank sand bonded with oil. The bank sand imparts the necessary green sand strength to prevent buckling, sagging or distortion while the core is drying. The lake sand provides the refractoriness to withstand the heat of the molten iron. A coating of wet blacking produces a clean, smooth surface on the core and in turn on the casting and of course reduces the cleaning cost. A clean smooth skin is one of the outstanding features of all castings made in the plant and one in which the management takes a legitimate pride.

In making the mold the bottom or foundation plate is set up true and level and a spindle is placed in a seat in the center. A sweep is attached to form the core prints and a shoulder seat around the perimeter to locate the outside wall accurately. A single layer of bricks conforming approximately to the desired shape is bedded in loam on the plate. The bricks are covered with loam and the sweep is revolved to impart the desired contour. After the loam has stiffened sufficiently, a heavy, substantial cast iron ring plate with four lifting lugs (*Please turn to page* 147)

Fig. 8 (Left)—Pouring a large casting with several ladles. Fig. 9 (Above)—An end view of a 38-ton casting. Fig. 10 (Below)—A large chemical pipe connection which weighs over 7½ tons. Fig. 11 (Right top)—Mold for a 38-ton casting with outside cores and two of inner cores in place. Fig. 12 (Upper right center)—Same mold with nearly all cores in place. Fig. 13 (Lower right center)—To resist the upward pressure or thrust of the metal, strong binding equipment is employed. Fig. 14 (Right below)—Another type of heavy casting made by the firm





CARRIES ON APPRENTICE TRAINING

By JOHN C. HUBEL

Left—Apprentice completing a mold for a steel casting. Above—Richard S. Falk, Falk Corp., Milwaukee, and head of the Wisconsin Chapter apprenticeship training program, is following in the footsteps of his father, Harold S. Falk, one of the pioneer apprenticeship leaders in the metal industry in the Middlewest

IN THE well considered opinion of Richard S. Falk of the Falk Corp., Milwaukee, chairman of the apprentice training committee of the Wisconsin Chapter of the A.F.A., the boy who takes advantage of the apprentice training programs now available is preparing for himself a place in the upper strata of industry. He is making an investment in job security for the future when industrial competition will be keener and when skilled hands and trained minds will be at a premium.

Pointing out that the present emergency has awakened America not only to the value of apprenticeship, but also to its absolute necessity, he claims that the all around training an apprentice receives makes him versatile, enables him to move around if necessary even in slack industrial periods because his general knowledge, and skill enables him to fill any one of a variety of positions satisfactorily.

The following points pertain to any worth while apprenticeship training program according to Mr. Falk:

Industry pays for the school hours, the light, heat and rent and for the instructors. The apprentice receives the industrial equivalent of a higher education at no personal cost. This is in marked contrast to conditions less than 100 years ago, where the apprentice lived with the master. In return for earnest endeavor from daylight to dark, he was fed and housed, given a homespun suit once a year and maybe a dollar or two every 3 months if he had no fines piled up against him. Even the hardy and truly remarkable master craftsmen developed by this Spartan process, see little probability of returning to the methods of the so called good old days.

Modern industry is careful in choosing apprentices. The cost is high and besides, the industrial hive has no place for drones. Qualifications for a present day foundry apprentice call for an alert mind and a healthy body. The day has (*Please turn to page* 160)

NYA TRAINS FOUNDRY WORKERS

IN SOME localities, industries requiring services of experienced foundry workers are finding an important reservoir of labor in the youth trained by the National Youth Administration. In NYA foundry shops scattered over the entire country thousands of young men between the ages of 17 and 24 are gaining basic experience in all phases of foundry work.

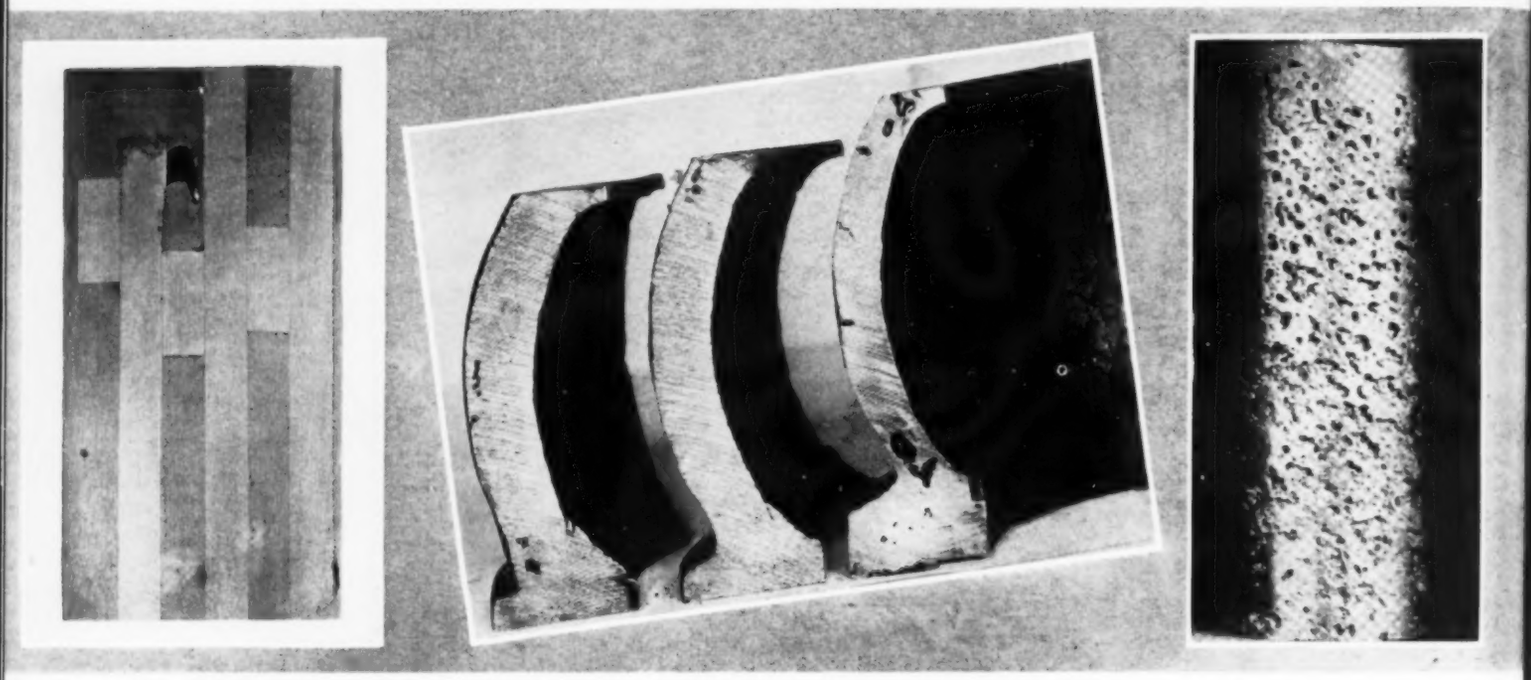
The turnover in NYA defense training shops has been accelerated greatly in recent months. During 1941, 10,000 NYA workers obtained jobs in the manufacture of iron and steel and their products. Many others obtained jobs doing foundry work in various plants manufacturing machinery and heavy equipment.

A Connecticut employer of foundry workers wrote to an administrator: "I would like to take this opportunity to give you a report of the satisfactory progress of the NYA boys (*Please turn to page* 159)

Views taken in a number of training foundries operated by the NYA in various localities

Molten Metal

AFFECT CASTING QUALITY



By Frederick G. Sefing

International Nickel Co. Inc.
New York

SUDDEN increase in defective castings without change in the metal mixtures or analysis, the sand or the molding practice, is one of the most disturbing things in foundry operation. While searching for the cause of the trouble, it frequently clears up of itself and we never learn what caused it or what overcame it. This baffling condition often prevails because of changes in the condition of the molten metal poured into the molds.

J. G. Pearce, director, British Cast Iron Research Association, in his A.F.A. exchange paper of 1930, said: "Variations in melting conditions influence the properties of the metal so markedly that they transcend such minor differences in composition as inevitably occur in ordinary practice in spite of the efforts to secure uniformity. These variations, not readily recognized in practice, are responsible for many anomalies met in foundry practice."

It is those variations in the molten metal with which this article has to deal. The first step toward controlling changes in molten metal is to know some of the factors which influence these changes. Then we can control these factors and repeatedly produce the desired metal.

Small quantities of gas in metal can cause *shrinks, draws,* and *porosity* in the last metal to freeze in much the same way as gases dissolved in water to be frozen cause a weak, snowy ice in the center of the otherwise sound ice cake.

Nitrogen, hydrogen, and carbon monoxide gases frequently are present in metals. The solution of gases in metals increases in general with rise in temperature and with the time of exposure at temperature.[1] Nitrogen can come from the air and from certain ingredients known to contain nitrides. Hydrogen is supplied by the oil or gas directly or by water vapor in the furnace gases according to the reaction $H_2O + Fe$ (or C) $\rightarrow H_2 + FeO$ (or CO).

The most common source of hydrogen in furnaces not using oil or gas, is the moisture in the air for combustion. Commercial methods for preventing hydrogen from this source are the use of blast drying devices of several types. Carbon monoxide gas is present in practically all furnaces and may be present in iron or steel from dissolved oxides; for example, $C + FeO \rightarrow CO + Fe$. Ferroalloys may con-

Conditions

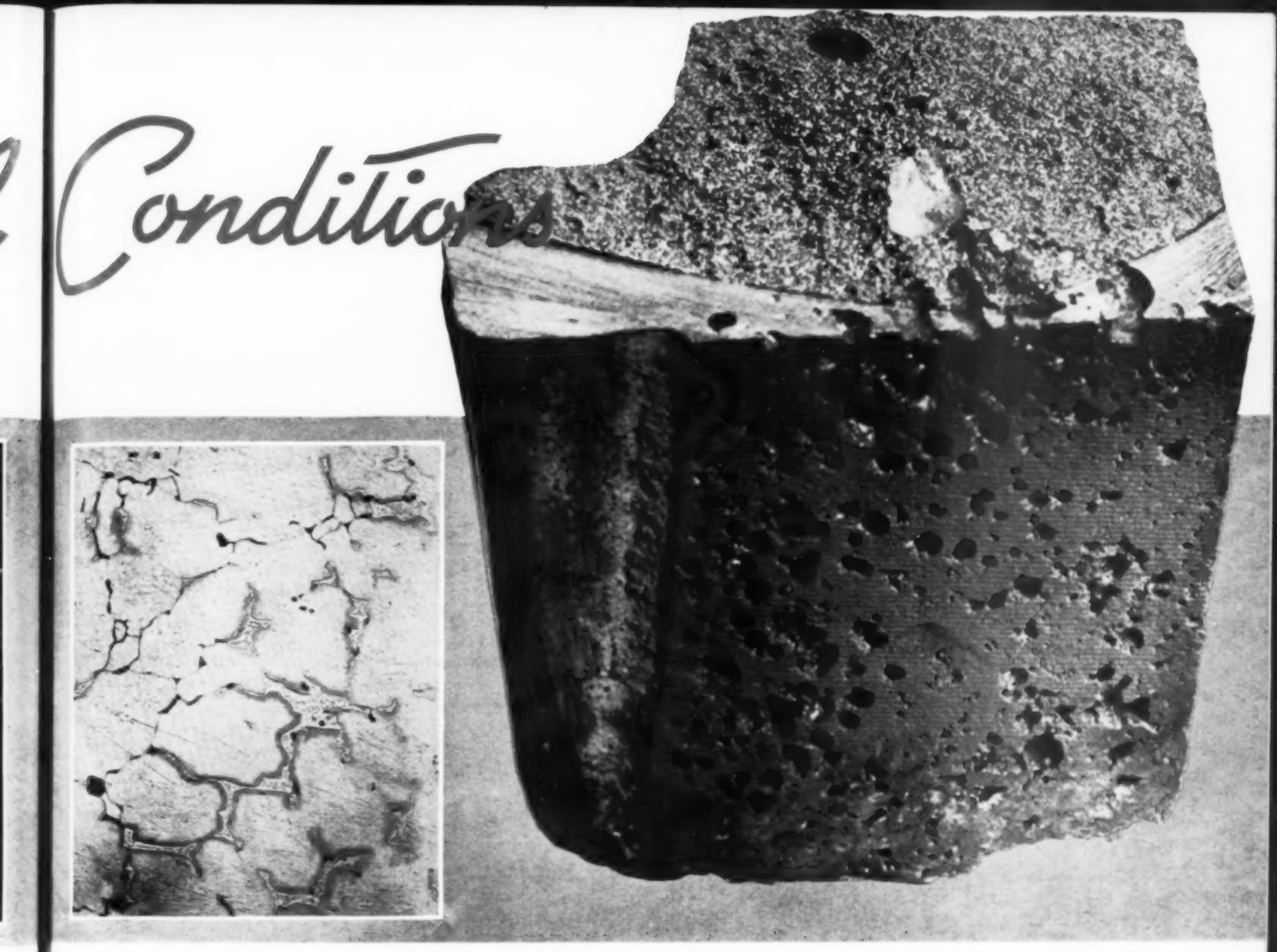


Fig. 1 (Extreme left)—Internal chills in steel casting did not unite with metal, and also caused blowholes. Fig. 2 (Left center)—Blowholes in boiler stop valves. Fig. 3 (Left)—Gas holes in 88-10-2 gun metal caused by casting at too high a temperature. Laing and Rolfe in Nonferrous Foundry Practice. Fig. 4 (Above)—Interdendritic shrinkage cavities and intercrystalline eutectoid in inferior quality 88-10-2 alloy. Laing and Rolfe in Nonferrous Foundry Practice. Fig. 5 (Right above) —Machining some times reveals a condition like this

tain gases which can be in sufficient quantity to affect the metal to which they are added.

Another source of gas in the metal is that developed from the moisture, sea coal facing, or binder in the mold surfaces next to the metal; for example, a square foot of sand 1/16 inch thick with 5 per cent H_2O produces about 2/3 cubic foot of steam at 212 degrees Fahr. and 2½ cubic feet at 2000 degrees Fahr. This is developed so quickly that it is under high pressure and some of the gas forced into the metal.

Inasmuch as gases get into molten metal, how can we prevent them from getting into the castings? Considerable gas can be removed by the ladle addition of cold metal shot. When metal freezes a large proportion of the gas is pushed out of the freezing metal and therefore it goes toward the last metal to freeze. We can aid this removal of gas by two precautions: (1) Pour the metal hot enough to permit excess gas to bubble out of the mold cavity; (2) Careful placing of vent risers and of feed risers so that the last metal to freeze is in the risers which will tend to draw the gases from the casting.

Silicates, oxides, sulphides, etc., occur more or less in all castings, and when present in excessive amounts they cause flaws, hot shortness, and impair the mechanical properties. Therefore, we should hold these inclusions to a minimum by preventing their occurence or by their removal, careful slagging, from the metal.

Silicates generally separate well from the metal with hot fluid metal and slag. However, when the silicates or slag particles are very small and thoroughly mixed with the metal, separation is usually not complete because of the long time required for these small particles to rise to the slag. Such a metal sprinkled through with silicate would show a high silicon content by analysis, whereas some of the reported silicon exists as silicates. Good slagging practice, then, is to remove the non-metallics effectively from the metal.

Oxides in molten metal are removed by thorough deoxidation just before pouring. It is important, however, not to deoxidize (*Please turn to page* 163)

Wants to Use Stoveplate Scrap For Making Radiators

We make cast iron radiators for steam and hot water, average metal thickness ⅛-inch, to withstand pressure test from 150 to 180 pounds per square inch. Lacking machinery scrap under present conditions, having a large amount of stove plate scrap on hand, we shall appreciate your advice on whether it is feasible to incorporate from 300 to 350 pounds of this scrap in a 1000-pound charge. Our pig iron contains 3.06 per cent silicon, 0.029 sulphur, 0.572 phosphorus and 0.87 per cent manganese.

With your present pig iron, a mixture of 50 per cent pig iron and 50 per cent scrap or even 40 per cent pig iron and 60 per cent stove plate should prove quite satisfactory for radiator castings. The usual analysis for this class of castings is silicon 2.25 per cent, manganese 0.70 per cent, sulphur 0.10 per cent, phosphorus under 0.80 per cent, total carbon under 3.50 per cent. The general run of stove plate scrap will show approximately the same analysis. While the silicon loss in the cupola runs from 20 to 25 points, this loss is compensated for by the relatively high silicon content of the pig iron. In fact with a 50-50 mixture and with good melting practice, you can improve the strength of the metal, without sacrificing the machinability, by adding from 5 to 10 per cent steel scrap to the cupola charge.

Blacking Forms Blisters on Sand Face When Warmed

We are forwarding a sample of sand to which dry blacking adheres satisfactorily, but on skin dried or dry sand molds the blacking peels when the sand begins to get warm. Facing sand contains 6 parts heap sand, 1 part new sand, 1 part pitch core compound and 1 part sharp sand.

The simple old fashioned molder's test of taking a quantity of the sand and squeezing it in the hand indicates that it is not suitable for foundry use. The sand grains are so fine and the clay content is so high, that the ball of sand feels like so much putty. A small lump dried on the radiator is almost as hard as a brick. Effect of the high clay content is to close the pores, or to put it another way, to reduce the permeability. Action of the blacking indicates the same condition. Damp clay in green sand holds the dry blacking on the face in the same manner that dampness or actual moisture promotes cohesion between many materials.

Wet blacking also adheres to the sand until the sand is heated. The generated steam cannot pass rapidly through the almost impermeable sand on one side and the film of blacking on the other side. It forms a parting film between the two and pushes the blacking out of the way. Since a green sand mold is closed after it is blacked, the foundryman cannot see the action when the mold is filled with metal. A close examination of the casting will show that the blacking left the face when subjected to the heat of the molten metal.

The casting is rough, dirty and scabby. The accumulation of dirty blacking may float to the top, or may be arrested somewhere in the passage, to only come to light when the casting is machined or tested for pressure. The pitch core compound is admirable with an open grade of sand, but is not suitable for use in your sand, where the permeability already is too low. Sea coal should be used instead. Certain forms of mechanical sand handling equipment might be employed to remove fines from the sand, but usually are considered economical and practical only in fairly large installations. The most obvious solution to your problem is to get a new source of sand supply.

Scrap Battery Plates Melted In Reverberatory Furnaces

Will you please advise us which is the most economical way to melt battery plates in mass production, and how is the antimony separated from the lead?

Probably the best procedure is to melt the plates in a reverberatory furnace with the addition of 3 to 5 per cent coke or coal fines. After the charge is melted down it should be rabbled well to insure good separation of the metallic lead from the drosses formed. The drosses are skimmed from the surface and removed preferably with a perforated ladle which permits any metallic lead to drop back into the bath.

The dross may be sold to a secondary smelter or held for reworking in the furnace with suitable fluxes. Some of the antimony will be removed in melting, and more is removed after the dross is skimmed from the furnace. That is accomplished by oxidation —through opening the side doors on the furnace to permit entrance of air and by blowing a blast of air over the surface of the molten bath. That procedure should reduce the antimony to 0.25 to 0.30 per cent. The antimony slag is skimmed from the furnace, and

if further reduction of antimony is desired the lead is treated in large iron pots with addition of 1 per cent zinc. The temperature should be around 1000 degrees, and the zinc stirred in well to insure reaction with the antimony. After stirring the temperature should be reduced to 750 to 800 degrees and the metal allowed to set quietly for 30 minutes or so. The zinc crust is removed with perforated ladles, and then the temperature raised to around 850 degrees. The remaining zinc then is removed by steaming.

For details of the recovery of lead from various wastes we suggest that you consult *Metallurgy of White Metal Scrap and Residues,* by E. R. Thews.

Silicon Bronze Castings Show Intercrystalline Shrinkage

In pouring castings from ingot silicon bronze, some results have been experienced which we are at a loss to understand. On some of the castings a small circle about ¼-inch in diameter appears. The circle is zinc colored and in its center there is a small hole. The metal is poured at 2200 degrees Fahr.

While insufficient information is given to permit a definite answer on the cause of your trouble with silicon bronze, it appears that it is interdendritic or intercrystalline shrinkage resulting most likely from insufficient feeding, although melting conditions may have some influence. Shrinkage of silicon bronze is about halfway between gun metal and manganese bronze, and the alloy has a narrow freezing range. Hence, large risers should be used to insure proper feeding, and the risers located over the heavy sections. Connection between riser and casting should be big enough to prevent freezing off.

Do not use charcoal for a cover during melting since experience indicates that better results are obtained without it. Use broken glass free from lead as the cover. See that the metal is not exposed to the furnace gases during melting. Furnace atmosphere should be neutral or slightly oxidizing. Reducing atmosphere results in a tendency of the alloy to absorb unburnt furnace gases.

You do not state the size of the castings being poured, but the temperature indicates that they are small or thin section. As a general rule small or light section castings are poured at 2050 to 2200 degrees Fahr., while medium to heavy weight castings are poured at 1900 to 2000 degrees Fahr.

Surface Blemishes on Aluminum Caused by Sand Condition

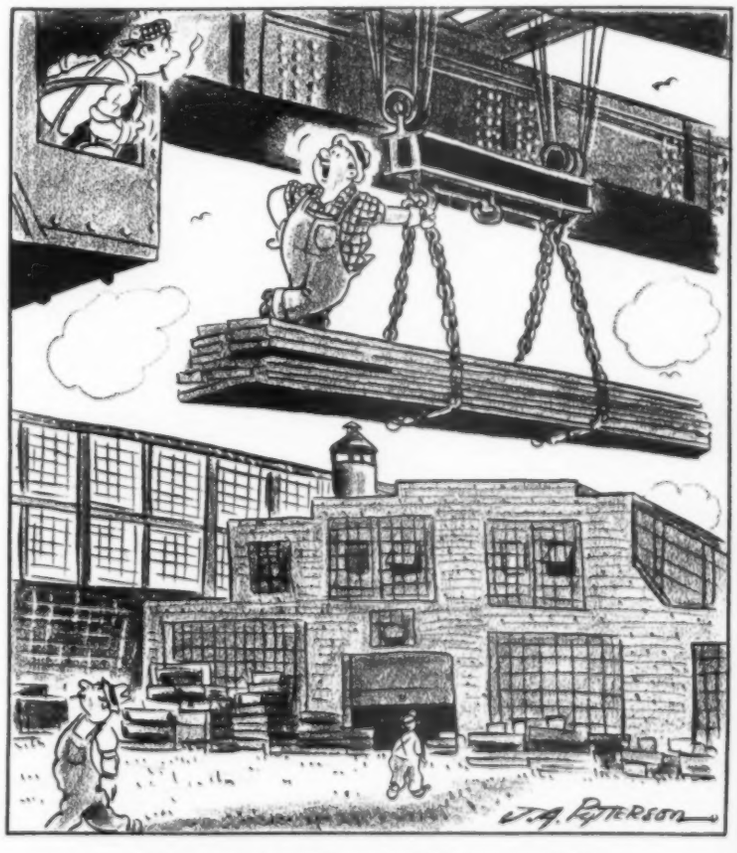
We have three or four sand heaps which in the past few months have developed surface blemishes. We are trying to determine the cause of the fine black specks covering the surface. The sand heaps were made up about 3 years ago and from time to time additions of new sand have been made for losses and rejuvenation. The alloy is a 4 per cent magnesium-aluminum alloy and we use a flux recommended for it. Similar defects show up on other aluminum alloys especially on castings which must be poured at high to medium temperatures. On heavy castings the defects do not show up so much.

Careful examination of the specimen submitted indicates that the small black surface blemishes are aggregates of molding sand grains mechanically held by metal penetration. Previous experience does not indicate that the type of alloy or the flux used are responsible for the difficulty. Generally, such a condition results from *sand balls* originating from improper sand conditioning. Factors usually involved include age of sand; moisture control, and conditioning procedure. Weight of the castings also is a factor. A sand that with occasional additions of new sand will last almost indefinitely, will deteriorate rapidly when used on heavy castings.

Three years would be considered the outside limit for the use of a sand heap unless large periodic additions of new sand are made. High moisture content or improper addition of water tend to cause clay segregation which forms sand balls. Water should be added in a spray fine enough to avoid washing of the clay and the moisture content should be maintained between 6 and 7 per cent. Frequent mulling, screening and aerating are desirable and prolong the life of the sand. If mechanical conditioning equipment is not available, the most economical procedure is usually the frequent addition of new sand, and strict moisture control.

Long life and maintenance of original properties usually are not found in heap sand unless mechanical conditioning is used. Where such equipment is not available, it is considered desirable to replace sand heaps entirely after a reasonable length of time, thereby avoiding casting difficulties.

GANGWAY! By J. A. Patterson



"How come they call you butterfingers, buddy?"

Sand-Cast Welding Rod Gives Trouble

We are having trouble trying to use sand-cast welding rod made from a wrought silicon bronze in that it appears to be wild and will not lay down in welding like metal from a commercial silicon bronze welding rod. We are using a commercial flux and wonder if that causes the trouble. We make no addition to the alloy and melt it under a glass cover.

While you do not mention the reason you are making sand-cast welding rods, it evidently is because you have some of the wrought scrap on hand, and decided to melt it down instead of selling it for scrap. That is sound reasoning since the material is worth more as welding rod than in the form of scrap. However, if usable material is employed for melting into rod, the cost will be much higher than for purchased welding rod.

We are not familiar with the welding flux you are using, but presumably it is one recommended by its manufacturer as suitable for the purpose. The only way to determine whether or not it is causing trouble, is to try welding without, or substituting some other recommended flux.

Your mention of wildness of the weld metal leads us to the opinion that the trouble may be due to gassed or oxidized metal which occurs during melting. Roast mentions the advisability of adding 3 ounces of 15 per cent phosphor-copper to 100 pounds of metal when melting a large proportion of scrap silicon bronze, and it is suggested you try that first. If that procedure does not give results, then presumably the metal has been melted under reducing conditions, and the metal contains gas.

Possibly the material you are melting is greasy and oily. If so, oil and grease should be removed previous to melting. As in the case of any nonferrous alloy, do not allow any of it to extend above the crucible at the beginning of melting. See that the alloy is melted as rapidly as possible, and do not permit it to remain in the furnace any longer than necessary after it reaches pouring temperature. With a coke fired furnace see that the flues and grates are open to give rapid combustion. In the case of an oil fired furnace see that the flame is sharp as opposed to smoky or luminous. One suggested method of determining whether the oil flame is oxidizing or reducing is to pass a piece of cold zinc slowly through it. If the piece remains clean the flame is oxidizing, but if soot is deposited on the zinc, the flame is reducing.

In welding, Roast also recommends the use of coated rods. The coating is composed of 90 per cent fused powdered borax (sodium borate), and 10 per cent sodium fluoride. The flux is mixed and melted in a stainless steel tube about 3½ inches in diameter and 14 or 15 inches long. The tube stands vertically in a furnace and the temperature maintained at 1500 degrees Fahr. Welding rods are dipped as nearly vertical as possible to provide a coating of uniform thickness. Rods are withdrawn slowly from the furnace, allowing the excess flux to drop back into the container.

Copper and Zinc Spoil Bath

What started out to be a 50-50 lead-tin bath we were using now contains about 1 per cent copper and 1 per cent zinc which make the bath sluggish. Is there any way those elements can be removed?

While the copper and zinc can be removed to a large degree from your lead-tin bath, the procedure should be left to a secondary smelter with the requisite equipment and experience in carrying out the various operations. Essentially the removal of copper and zinc are removed by selective separation, sulphurization, and steaming.

The first two remove most of the copper and part of the zinc, and the third removes most of the remaining zinc. However, those various operations also cause loss of part of the lead and tin since the drosses containing the copper and zinc also entrain a certain amount of the metallic bath. The procedure is to melt in a large cast iron pot which is filled almost to the top. The molten metal is mixed thoroughly, and then firing is discontinued. The bath is allowed to cool slowly and as the temperature decreases a viscous dross begins to form on the surface, and gradually hardens. When the layer is about ½-inch thick it is removed with a perforated ladle which permits the fluid, white metal to drain and leaves behind a dry, crystalline mass containing the bulk of the copper.

To obtain greater removal of copper the metal then is subjected to sulphurization which is accomplished by plunging stick or lump sulphur to the bottom of the pot. The sulphur is contained in a perforated box on the end of a long rod to insure adequate immersion, and maintaining that condition to effect an intimate contact between sulphur and the molten bath. The dross formed likewise is removed as indicated previously. During sulphurization some of the zinc is removed with the copper, and the remainder is eliminated by a so-called steaming operation.

In that operation a small pipe reaching to the bottom and center of the metal pot conducts a small quantity of water to that point—just sufficient to cause a slight boiling or seething of the molten metal. It is advisable to use two valves on the pipe. One is close to the pot rim and the other opening into the water supply line not far away. In operation the valve at the pot rim is tightly closed, and that to the water line opened full. Then the valve at the rim is gradually cracked open until the boiling or seething occurs. After that the main valve can be closed back to where the seething continues.

Steaming is continued from 10 to 15 minutes at which time all of the sulphur and zinc are eliminated. In stopping the operation, the valve closing takes place in the reverse order as previously described. That is to say, the valve at the pot rim is closed first, followed by the main valve.

To Melt Steel Scrap In the Cupola

We have quite an accumulation of thin sheet steel scrap from our welding class room. We want to melt this scrap in a manner to pour gray iron castings. We have a 500-pound electric arc furnace and a 24-inch cupola. Which of these is better adapted to the purpose? Is there any other way of utilizing this scrap?

Taking the last question first, the best way of disposing of the contaminated scrap from the welding class room, is to sell it to a junk man—if he will take it. If existing conditions force you to use it and convert it into gray iron, you can melt it in either the arc furnace or in the cupola. It can be melted quite satisfactorily in either of these furnaces, but by itself the resulting metal will not be gray iron. You will have to add a sufficient amount of pig iron, or high class gray iron scrap, or ferrosilicon and ferromanganese to the charge to secure the desired gray iron analysis.

In the cupola the metal will pick up carbon. In the electric furnace carbon is taken from petroleum or pitch coke added to the charge. Low carbon steel contains negligible amounts of carbon, silicon and manganese. A simple calculation will indicate the correct amount of alloys which must be added to produce a metal containing 3.00 to 3.25 per cent carbon, 2.50 per cent silicon and 0.50 per cent manganese. The phosphorus and sulphur will take care of themselves. Thin steel scrap has a tendency to oxidize or burn at high temperatures. Therefore, it may be advisable to pack the scrap in small wood boxes, tin cans or lengths of stove pipe and charge it in the center of the cupola. The charge should be fluxed liberally with limestone or fluor spar.

Metal facts... Organized *for Production Victories*

American industry...in the rush of converting its plants to war production...needs much new information about alloys. Such information...detailing the selection, fabrication and uses of ferrous and non-ferrous Nickel alloys...is available promptly from our files of technical reports and shop guides.

And, as further support in the battle of production, we offer the assistance of our engineering staff and field service men. Their recent experiences in many plants, their practical knowledge of ways to overcome shortages of materials, makes them especially helpful during wartime.

Nickel...and information about Nickel ...goes wherever they best speed Victory.

Nickel

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK, N. Y.

men of industry

CHARLES H. MCCREA has been appointed first vice president and elected to the board of directors of the National Malleable & Steel Castings Co., Cleveland. Mr. McCrea was born in Logansport, Ind., in 1890, and was graduated from Purdue University with a bachelor of science degree in civil engineering in 1912 and a degree in civil engineering in 1916. After graduation in 1912, until the end of that year, he was connected with the engineering departments of the Pennsylvania and Erie railroads. He then joined the National Malleable & Steel Castings Co., Toledo works, as a sales engineer and in September, 1914, was transferred to the Chicago sales office where he remained until 1916. Until June, 1917 he was associated with the St. Louis sales office, and then resigned to enter military service. During the war he was a captain in the cavalry. In January, 1919 he returned to the St. Louis sales office and in May of that year was made district sales manager in the St. Louis territory, remaining in that position until January, 1931 when he was made sales manager of the Cleveland works. Mr. McCrea was appointed manager of the Cleveland works in January, 1938.

♦ ♦ ♦

SIXTEN LANGENBERG recently joined the American Steel Foundries, Granite City, Ill. as a special engineer on cast armor plate. Mr. Langenberg studied mechanical drafting at the Chicago Technical College and from 1917 to 1922 was a machinist apprentice at the Acme Motor Truck Co., Cadillac, Mich. The following 4 years he served as patternmaker and pattern foreman with Cadillac Malleable Iron Co. His next connection was with the International Harvester Co., Chicago for 1 year, and from 1930 to 1936 he was pattern foreman, O. W. Hedstrom Pattern Works, Chicago. Prior to joining the American Steel Foundries, Mr. Langenberg served as pattern foreman, National Malleable & Steel Castings Co., Cicero, Ill.

♦ ♦ ♦

GEORGE A. SEYLER, works manager and director, Lunkenheimer Co., Cincinnati, was elected second vice president and treasurer of the National Metal Trades Association at its convention held in New York.

♦ ♦ ♦

MAXWELL Y. SNOW has been appointed circuit foundry instructor, Wisconsin Vocational Schools. The circuit consists of 11 cities in which indentured apprentices and journeymen are serving. Mr. Snow graduated from Stanford University in 1936 and received his bachelor of science degree in mechanical engineering. For 4 years he was connected with the Allis-Chalmers Mfg. Co., Milwaukee, serving as graduate engineer, inspector in heat treating department, and as cupola foreman in the foundry. In 1941 he was appointed associate inspector of naval materials and was stationed at the Allis-Chalmers plant.

♦ ♦ ♦

CLYDE A. SANDERS, ceramic engineer, formerly general manager, Lawrence Clay Co., Jackson, O., has been made sales manager, American Colloid Co., Chicago.

♦ ♦ ♦

JOHN J. FITZGIBBON, formerly foundry engineer, Whitehead Metal Products Co., New York, has joined R. Hoe & Co., Dunellen, N. J., as metallurgist.

♦ ♦ ♦

MAJ. GEN. LEVIN H. CAMPBELL JR., has been made Army chief of ordnance, replacing MAJ. GEN CHARLES M. WESSON, whose tour of duty expired June 2. General Campbell spoke at the recent Cleveland A.F.A. convention.

♦ ♦ ♦

GEORGE D. ANDERSON JR., Commonwealth Products Co., Birmingham, Ala., has been appointed representative, Mahr Mfg. Co., Minneapolis, in Alabama, Florida, Georgia and Mississippi.

♦ ♦ ♦

CHARLES HALCOMB, present chief of the Products Section, Iron and Steel Branch, War Production Board, Washington, has been made chief, Allocations and Priorities Section, succeeding Stanley B. Adams. David Austin, executive consultant to the branch, is the new chief of the Products Section. Mr. Adams

(Continued on page 86)

Charles H. McCrea

Maxwell Y. Snow

Sixten Langenberg

George A. Seyler

Woodward

●●●—

Uniform

PIG IRON

WOODWARD IRON COMPANY

WOODWARD, ALABAMA

America's Largest Completely Integrated and Entirely Independent Merchant Iron Producer

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

(*Continued from page* 84)
has been placed in charge of coordinating PD-25A information for the Materials Division and later will join the Bureau of Priorities of the Division of Industry Operations.

♦ ♦ ♦

DONALD J. REESE, foundry research engineer, Research and Development Division, International Nickel Co., Inc., New York, has been appointed

Don J. Reese

to the Metallurgical and Specifications Units, Iron and Steel Section, Materials Division, War Production Board, Washington. Mr. Reese will specialize in problems connected with ferrous castings.

♦ ♦ ♦

E. J. FULLER, executive vice president, Hunt-Spiller Mfg. Corp., Boston, has been elected general manager. VICTOR W. ELLET, president, will devote more time to corporate matters in addition to his presidential duties. A. B. ROOT JR., has been appointed vice president; FRANK W. LAMPTON, sales manager and JOSEPH GOOSTRAY assistant general manager.

E. J. FULLER was born in Clinton, Iowa in 1883. Upon completing his machinist apprenticeship with the Chicago & North Western Railroad, Clinton, he continued as machinist and later was appointed to a supervisory position in the mechanical department. From 1911 to 1913 he was chief inspector of new equipment for the railroad company at the Schenectady, N. Y. plant of the American Locomotive Co. He joined Hunt-Spiller in 1914 and served as mechanical representative until his appointment as assistant manager in 1927. He became sales manager in 1928, was elected executive vice president in 1936, and continues to hold that position in addition to his new duties as general manager.

A. B. ROOT JR., born in Boston in 1886, and was graduated from Tufts College in 1909 with a degree in civil engineering. During his early career he was employed in the maintenance of way department of the Boston & Albany railroad and with the Stone & Webster Engineering Corp. as resident engineer on power projects in Montana, Nevada and Georgia. He joined the Hunt-Spiller Mfg. Corp. as mechanical engineer in November, 1912, and subsequently held positions of assistant to the vice president, assistant to the president, and assistant general manager, which position he held until his appointment as vice president in March, 1942. Mr. Root is a past president of the A.F.A.

FRANK W. LAMPTON, a native of Fort Scott, Kans., was graduated from Windsor Business College, Fort Scott. He was employed as a machinist's apprentice with the St. Louis-San Francisco railroad from 1907 to 1912, and as machinist from 1912 to 1915. The following 2 years he served as master mechanic with the Arcadia Coal & Mining Co., Arcadia, Kans. He again became connected with the St. Louis-San Francisco Railroad and was with that company until he joined Hunt-Spiller in 1926 as mechanical representative in the Southwest territory. Mr. Lampton was appointed assistant sales manager in 1941, the position he held until his recent appointment as sales manager.

JOSEPH GOOSTRAY, was born in Boston, in 1890, and was educated as a mechanical engineer at Northeastern University. He joined Hunt-Spiller in August 1914. During the first World war he enlisted in the United States Navy and served as chief draftsman in the engineering and repair office of the U. S. submarine base at New London, Conn., returning to Hunt-Spiller when the war ended. Later positions include: Assistant mechanical engineer, mechanical engineer, and finally mechanical superintendent in charge of maintenance and operation of mechanical and electrical equipment, and of all the departments in which finished machine products are manufactured by the corporation.

♦ ♦ ♦

RALPH W. PORTER, president, Swindell-Dressler Corp., Pittsburgh, was elected president and chairman of the board of directors, Industrial Furnace Manufacturers' Association, at the group's annual meeting held recently at Hot Springs, Va.

♦ ♦ ♦

R. W. MILLER, for the past 12 years connected with the Pittsburgh Plate Glass Co., Pittsburgh, has been appointed manager of the technical service department of that organization Columbia Chemical Division.

♦ ♦ ♦

COL. DONALD ARMSTRONG, chief of the Chicago ordnance district, has been appointed brigadier general in recognition of meritorious service. He has been stationed in Chicago since July, 1939, after having served from 1935 as chief of the army's maintenance division.

♦ ♦ ♦

JOSEPH D. GLATZ, Chicago sales, engineer for the Harnischfeger Corp., Milwaukee, in the Central West territory, recently was made chief, crane unit, tools branch, War Production Board, Washington, succeeding SIDNEY BUCKLEY, presi-

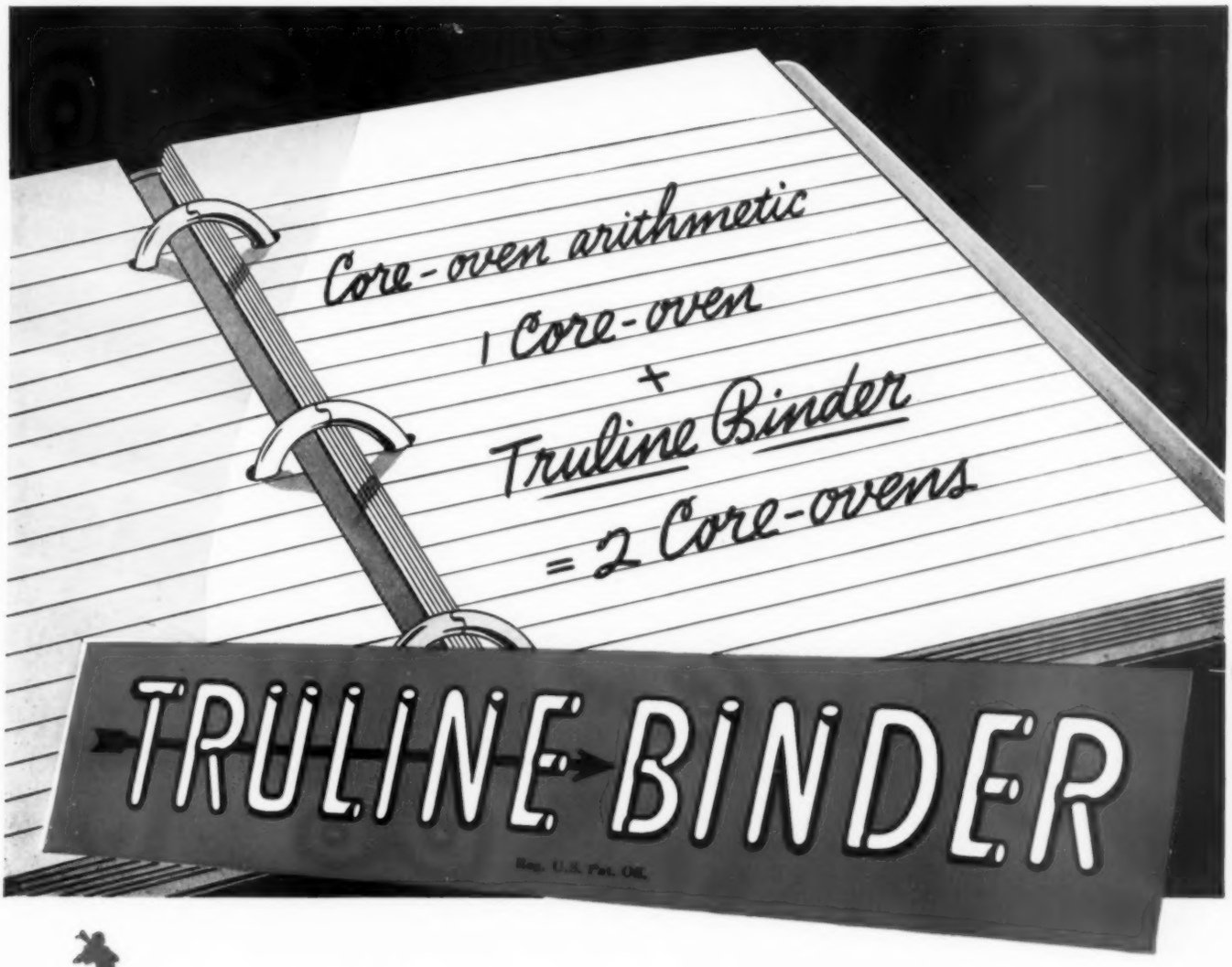
(*Continued on page* 88)

James Goostray

A. B. Root Jr.

E. J. Fuller

Frank W. Lampton



Suppose it takes four hours to bake cores with the binder you are using. Chances are, you can cut that to two hours with Truline Binder. Or, if you've got conveyor-type ovens, you may eliminate the "second trip through" on those large cores.

That is, your ovens will double their output. On every shift you'll turn out more cores with Truline. It's the same as if you had that many more ovens.

But that's not all. You've got to clean the cores out of your castings. Here again you save with Truline. It takes less time, sometimes only a half to a third as long, to remove Truline cores, because they burn out so fast.

Whether you're producing steel, grey iron, malleable, or non-ferrous castings, Truline Binder may cut costs and boost output in your foundry. Why not find out about it? Clip the coupon to your letterhead and mail it today.

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HERCULES POWDER COMPANY

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Please send ☐ sample ☐ information on how to use Truline Binder in casting: .....
(state type of work and kind of metal cast)

.....

Name _____

Company _____ *Title* _____

Address _____ *City* _____ *State* _____

JJ-50

(*Concluded from page* 86)
dent, Shepard-Niles Crane & Hoist Corp., Montour Falls, N. Y., who recently resigned as chief of the unit.

♦ ♦ ♦

K. H. HAMBLIN, formerly general superintendent in charge of manufacturing, Keeley Stove Co., Columbia, Pa., has become connected with

K. H. Hamblin

the Forgings and Castings Unit, Iron and Steel Branch, War Production Board, Washington, in charge of malleable castings.

♦ ♦ ♦

A. G. GIERACH, plant manager, American Manganese Steel Division, American Brake Shoe & Foundry Co., Chicago Heights, Ill., has been elected chairman of the Chicago Chapter of the A.F.A. Mr. Gierach was born in March, 1892 in Thiensville, Wis. and was educated in the public schools of that city. He graduated with a bachelor of science degree in chemical engineering from Purdue University, Lafayette, Ind., in 1916. Immediately after graduation Mr. Gierach joined the American Manganese Steel Division at its main plant in Chicago Heights. His first position was that of analysist in the metallurgical department, and in 1918 he was transferred to the melting department. Later he was appointed assistant works manager, and was made works manager Jan. 1, 1940. The past year he has served as president, Electric Metals Workers Guild, and is chairman of the Southurban branch of the Greater Chicago Safety Council.

♦ ♦ ♦

FREDERICK A. MELMOTH, vice president, Detroit Steel Casting Co., Detroit, has been elected chairman of the Detroit Chapter of the A.F.A. Mr. Melmoth was born near Sheffield, England, and received his technical training at Sheffield University. From 1908 to 1917 he was connected with the Brown-Bayleys Steel Works, Sheffield, as assistant metallurgist and steel maker. Later he was associated with Lake & Elliot, Braintree, England, and the National Steel Foundry, Scotland. In 1926 he became foundry manager, Thomas Firth & Sons Ltd., Sheffield, which position he held until coming to the United States to take a position with the Detroit Steel Casting Co. in 1930.

♦ ♦ ♦

JOHN H. TRESSLER, resident manager, Hickman, Williams & Co., Cleveland, has been elected president, Northeastern Ohio Chapter of the A.F.A. Mr. Tressler is a native of Cincinnati, and was educated in the public schools of that city. He was connected for a time with the Standard Oil Co. in Louisville, Ky., and served 18 months in the army in the medical service and officers training camp in Texas. In 1919 Mr. Tressler joined the Cincinnati sales department of Hickman-Williams company and was transferred to the Cleveland office in 1923. He has been active in the affairs of the chapter, having served as secretary and a director.

♦ ♦ ♦

VICTOR F. STINE, vice president in charge of sales, Pangborn Corp., Hagerstown, Md., completed 30 years of continuous service with that organization on July 1. Mr. Stine joined Thomas W. Pangborn immediately upon graduating from high school in 1910 as general assistant private secretary, and in the years that followed, worked through every department in the administration of the company's business, including accounting, credits, purchasing, production, and sales. Officially, he has been auditor, assistant

Victor F. Stine

secretary, assistant treasurer and secretary of the Pangborn Corp. In 1931 he was made sales manager, in 1935 he was elected second vice president and in 1940 he was advanced to his present position of vice president.

♦ ♦ ♦

E. A. THOMAS, president, Thomas Foundries, Inc., Birmingham, Ala., recently was elected chairman of the Birmingham District Chapter of the American Foundrymen's Association. Mr. Thomas was born in Georgia and moved to Birmingham while still a young boy. He attended the public schools of Birmingham and later was employed by the Thomas Grate Bar Co., which was organized by his father. In 1927, upon the death of his father, he was elected president of the Thomas Grate Bar Co. In 1938 the name of

(*Concluded on page* 90)

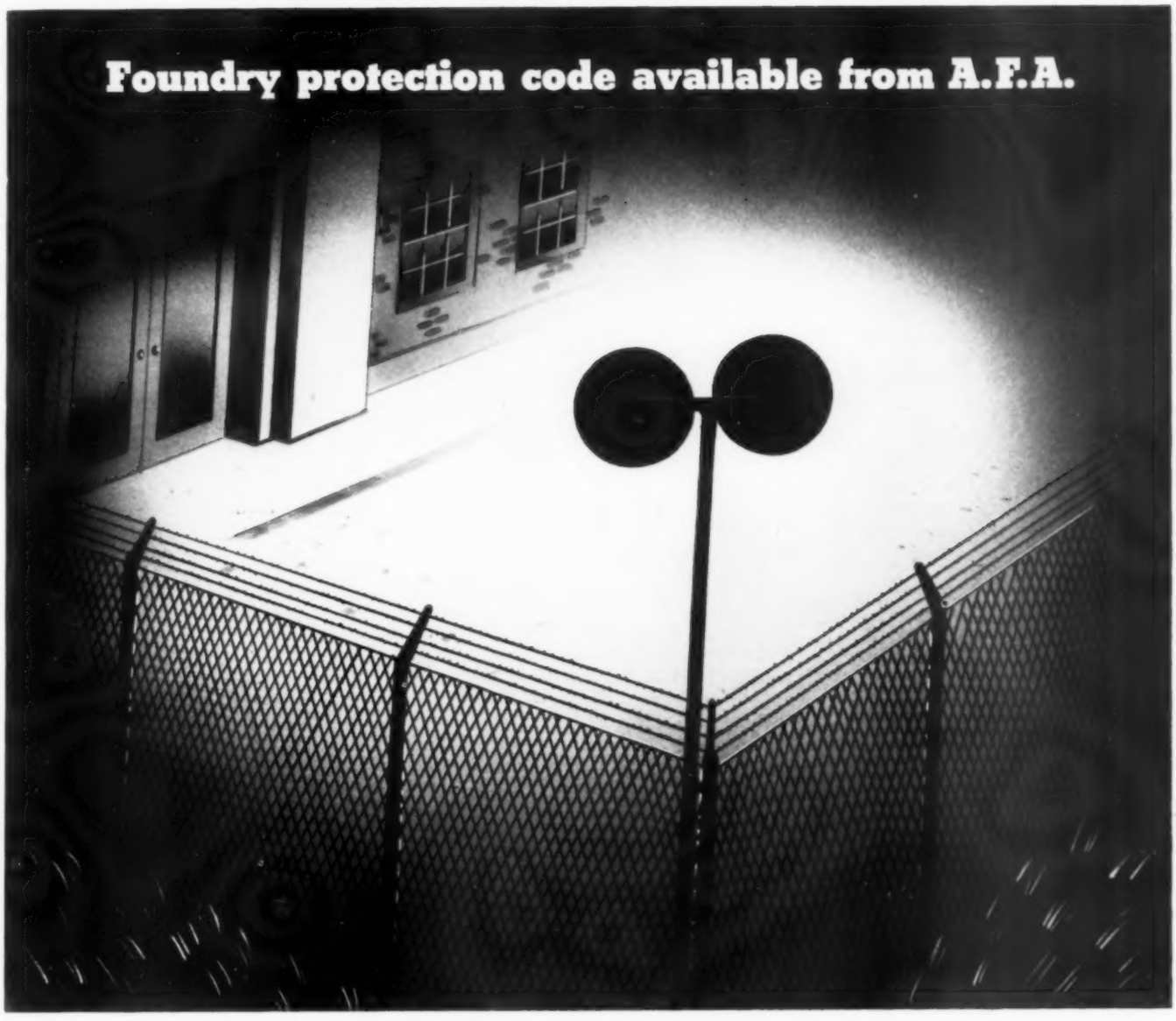
F. A. Melmoth

J. H. Tressler

A. G. Gierach

E. A. Thomas

Foundry protection code available from A.F.A.



Information taken from "The Foundry" June 1942

The code of recommended practices for the protection of life, property and production in the foundry industry during the war is being published in this and subsequent issues of "The Foundry" through the cooperation of the American Foundrymen's Association and its industrial hygiene code committee.

The code covers every conceivable phase of plant protection against either sabotage or actual hostilities in considerable detail. It also covers the matter of personnel protection and control very thoroughly. It has the approval of the Office of Civilian Defense.

Since the subject matter covered in the code is of vital importance to every foundry many undoubtedly will wish to procure the entire report before publication can be finished in "The Foundry".

The complete code in multigraph form may be purchased through the American Foundrymen's Association, 222 West Adams Street, Chicago, Ill. for $1.50.

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.
MOLYBDIC OXIDE BRIQUETTES FOR THE CUPOLA • FERROMOLYBDENUM FOR THE LADLE

Climax Molybdenum Company
500 Fifth Avenue · New York City

MOLY

(*Concluded from page 88*)

the organization was changed to Thomas Foundries, Inc. and the firm became active in the jobbing foundry business, with particular emphasis on the production of alloyed cast iron.

♦ ♦ ♦

ROBERT C. ONAN, recently has been appointed district sales manager for northern Illinois, Iowa, Wisconsin, and Minnesota, Lindberg Engineering Co., Chicago. His headquarters will be at the company's recently opened offices, 606 West Wisconsin avenue, Milwaukee. Mr. Onan formerly served as advertising manager for the same company.

♦ ♦ ♦

WILLIAM C. JOHNSON, formerly sales manager, crushing and cement division, Allis-Chalmers Co., Milwaukee, has been appointed manager of the company's general sales organization. Mr. Johnson succeeds WALTER GEIST, who up until his election as president of the company, directed the general sales organization.

♦ ♦ ♦

CHARLES O. BUTLER, formerly superintendent, Warren Pipe Co. of Massachusetts Inc., Everett, Mass., recently joined the Hamilton Foundry & Machine Co., Hamilton, O. Mr. Butler was born in Warren county, N. J., and completed his elementary education at the Belvidere, N. J. high school. He attended Lafayette College, Easton, Pa., as a student in mechanical engineering, but left to accept a position in the engineering department of the Ingersoll-Rand Co., Phillipsburg, N. J., where he served for 1 year. He then transferred to the Treadwell Engineering Co., Easton, Pa. In 1921 he joined the Warren Foundry & Machine Co., Phillipsburg, N. J., as a mechanical draftsman, and a year later was transferred to the inspection department of that company, later becoming chief inspector. In 1929 the company, then organized under the name of the Warren Foundry & Pipe Corp., constructed a new centrifugal cast iron pipe plant at Everett, Mass., and Mr. Butler was appointed superintendent. He has been active in the work of the New England Foundrymen's Association, and recently served as president of that group.

♦ ♦ ♦

RICHARD F. BERGMANN has been appointed chief engineer, Link-Belt Co., Chicago. He succeeds WILLIAM W. SAYERS, chief engineer since 1925 who has been appointed consulting engineer. Mr. Bergmann is a native of Logansport, Ind., was graduated from Rose Polytechnic Institute, Terre Haute, Ind. in 1918, and joined Howe Chain Co., Muskegon, Mich., after brief service as an ensign in the U. S. Navy during the last war. Following merger of Howe Chain Co. with Link-Belt Co., he was transferred to Chicago in 1924, first becoming chief engineer of the Link-Belt Caldwell plant. In 1933 Mr. Bergmann was appointed assistant to Mr. Sayers and he resigned that position to become chief engineer, Rayon Machinery Corp., Cleveland in 1936, from which position he returns to Link-Belt.

♦ ♦ ♦

GEORGE C. HEIKES has been appointed chief, Zinc Branch, War Production Board. Mr. Heikes replaces DAVID UEBELACKER, who has been recalled by his firm, Ford, Bacon and Davis, New York.

♦ ♦ ♦

L. R. SORENSON, formerly assistant naval architect, Newport News Shipbuilding & Dry Dock Co., Newport News, Va., has been appointed cost engineer in the production department to succeed George Brick Smith who died recently.

♦ ♦ ♦

MAURICE B. BRADLEY, since 1924 in charge of the Cleveland branch office, Robins Conveying Belt Co., Passaic, N. J., now is serving as a major in the Coast Artillery Corps, United States Army. The Cleveland office now will be under the supervision of S. F. KNIGHT who will also continue in charge of the company's Detroit office.

♦ ♦ ♦

ALLAN MCKAY has been appointed general manager, Kaukauna Machine Corp., Kaukauna, Wis., succeeding W. H. ROLOFF, resigned. Mr. McKay formerly was with the Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.

♦ ♦ ♦

C. M. WILCOX, formerly with the Office of Price Administration Standards Section, has been named chief of the recently organized Plumbing Section, Plumbing and Heating Branch. The section will be responsible for plumbing fixtures.

♦ ♦ ♦

REGINALD S. DEAN, chief of the Metallurgical Division, Bureau of Mines, Washington, has been appointed assistant director of the bureau. Before joining the Bureau of Mines staff in 1929 as chief engineer, metallurgical division, Mr. Dean held positions in the research departments of American Zinc, Lead & Smelting Co. and Anaconda Copper Mining Co., and was metallurgical development engineer, Western Electric Co.

Mark Long Service

Nearly 6000 employes of the Allis-Chalmers Mfg. Co., Milwaukee, have been presented with certificates and emblems for service ranging from 10 to more than 50 years. Forty one employes had 50 or more years of service. In recognition of their long employment they were presented with diamond studded pins by officials of the company. Other groups included 155 employes with 40 years service, 690 with 30 years, 1477 with 20 years or more and 3515 who have served at least 10 years. In addition to the service awards, each veteran was presented with a copy of the publication *We Work for Victory and We Plan for Peace*, also with *and We Plan for Peace.*

R. C. Onan

C. O. Butler

R. F. Bergmann

W. C. Johnson

EVERDUR INGOTS

This copper-silicon alloy possesses many of the desirable properties of the tin bronzes.

The nominal composition of Everdur Ingots is Copper, 94.90; Silicon, 4.00; Manganese, 1.10. This composition will meet the requirements of recognized standards such as Navy Specification 46B28 and Federal Specification QQ-C-593.

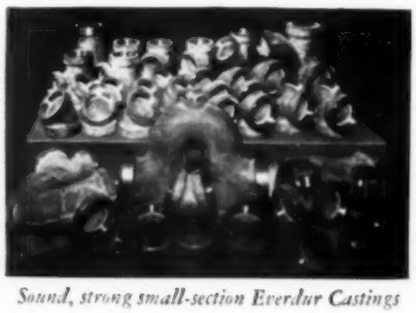
Everdur standard test coupons cast in green sand will have these approximate physical properties:

Tensile Strength	50,000 p.s.i.
Yield Strength*	20,000 p.s.i.
Elongation	25% in 2″
Reduction in Area	25%
Brinell No. (10 mm. ball, 500 Kg. load)	80

*At 0.50% elongation under load

General Properties

Melting Point	1832°F. (1000°C.)
Specific Gravity	8.23
Weight	0.297 lb. per cu. in.
Pattern Maker's Shrinkage	5/16″ per ft.



Sound, strong small-section Everdur Castings

Everdur has been successfully used over a 15-year period for the production of strong, sound castings. It is furnished ready for use in 25-pound notched ingots and can be melted and cast by regular brass and bronze foundry equipment.

Cast Everdur manifold. Weight 1,714 lbs.

Foundry Practice

Anaconda Publication E-1, offered free, presents a *detailed* discussion of foundry practice with Everdur.

Contents of this publication include suggestions for composition and control of the charge; types of furnaces for melting; fluxing and melting procedure; practices in molding, types of sand, core construction, pattern making, gating, etc. Pouring data are presented, as well as detailed instructions for the cleaning and finishing, machining, welding and heat treating of Everdur castings.

Summary

Everdur copper-silicon alloy for casting purposes is a high-strength material, relatively inexpensive but possessing many of the desirable properties usually associated with higher-priced metals.

Everdur offers outstanding resistance to a large number of normally corrosive solutions and atmospheres. Obviously, it is not equally resistant to all. Information regarding the corrosion resistance of Everdur under specific conditions may be obtained from the Technical Department of The American Brass Company. This service is available without cost.

Anaconda Publication E-1, 6th Edition, contains detailed information on general properties, charging, melting, molding, pouring, etc., of Everdur Metal. Write for a copy. 41153A

Everdur Metal

THE AMERICAN BRASS COMPANY

General Offices: Waterbury, Connecticut

In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ont.—*Subsidiary of Anaconda Copper Mining Co.*

EVERDUR is a trademark of The American Brass Company, registered in the United States Patent Office

among Detroit foundries

BY A. H. ALLEN
Detroit Editor,
The Foundry

FIRST photographs of important developments in Ford foundries are shown in the accompanying illustrations. They were taken at an exhibit of aircraft products sponsored by Ford recently in Detroit at the Horace H. Rackham Educational Memorial, in conjunction with a joint meeting of the Engineering Society of Detroit and the Society of Automotive Engineers. Thousands of engineers attended the one-day meeting and exhibit.

While the various castings shown in the illustrations were featured in the exhibit, the display also included aircraft engines of World War I, the experimental Ford V-12 aircraft engine with exhaust driven supercharger, an 8-cylinder version of this same engine perfected for installation in tanks, a Japanese Mitsubishi radial engine shot down over Pearl Harbor, a German Mercedes-Benz inverted-V-12 engine, as well as a variety of airplane parts and accessories.

Interesting feature of the Ford-designed airplane engine is the use of vertical shafts driven through worm gear and pinion to operate dual camshafts on both Vees of the engine.

Extent of acceleration in Ford steel casting activity, of which armor plate will be an important part, is seen in the estimates that by the end of the year Ford will be requiring scrap at a rate of 2000 tons per day—for blast furnaces, electric furnaces, cupolas and open hearths—comparing with present requirements of around 1000 tons per day. Likelihood of meeting the doubled figure is seen as slight, since large melters even now are unable to build up inventories of scrap against next winter.

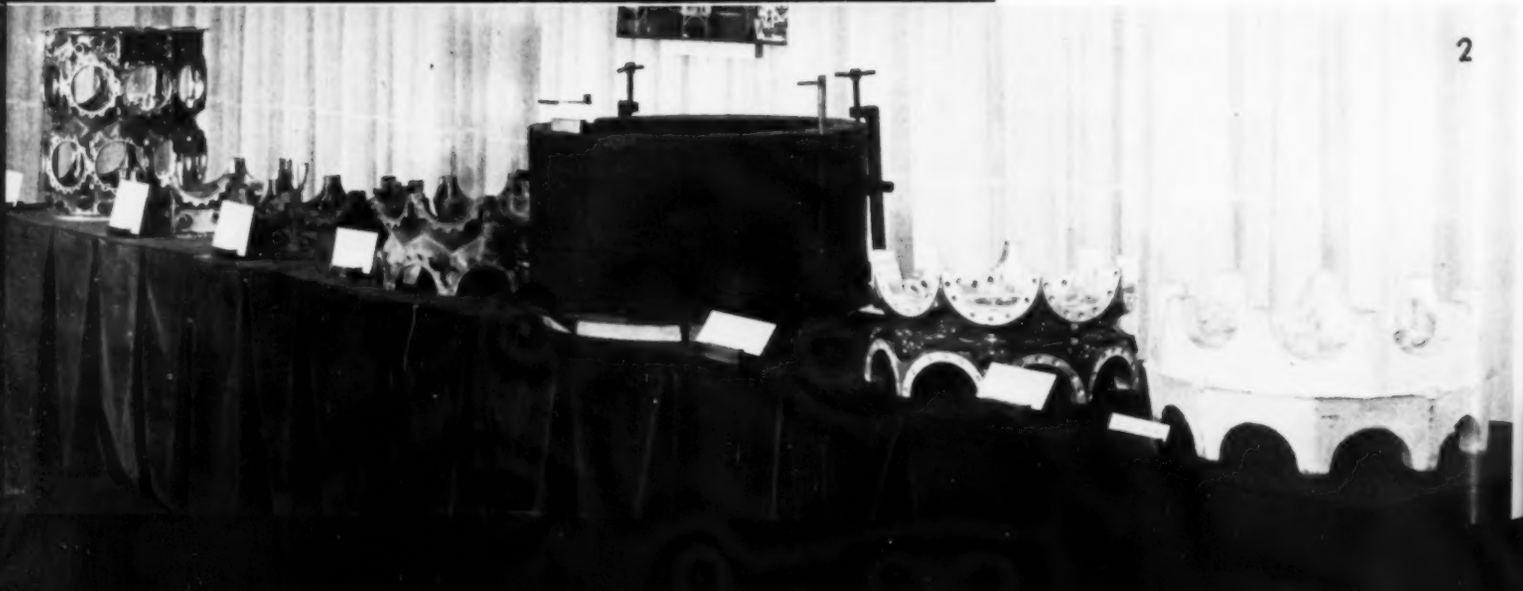
Descriptions of the castings shown in the illustrations are as follows:

Fig. 1—Centrifugally cast aircraft engine cylinder barrels of a chrome-molybdenum alloy steel, rough castings at the right. Two sets of machined barrels at the left show results of hydrostatic tests, those which failed being made some time ago and the other two just recently. Improvements in casting technique resulted in no failure under loads even higher than those applied to the barrels which split. Successful application of the cast steel cylinder barrel on radial aircraft engines, which now appears likely, will relieve some of the pressure on sources for forgings of this type, facilities for which are limited.

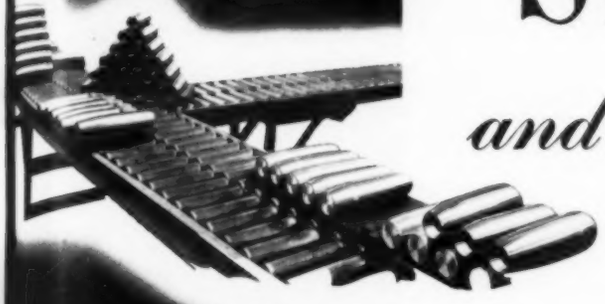
Fig. 2—On this table are the results of months of experimental work by Ford foundry engineers in adapting cast steel crankcase sections to replace forged aluminum. In the center is the green sand mold in which center section is cast. To the left of it are front, rear and center sections of the crankcase, as cast, with the machined assembly at the far left. To the right of the mold is the forged aluminum center section, before and after machining. At present the steel assem-

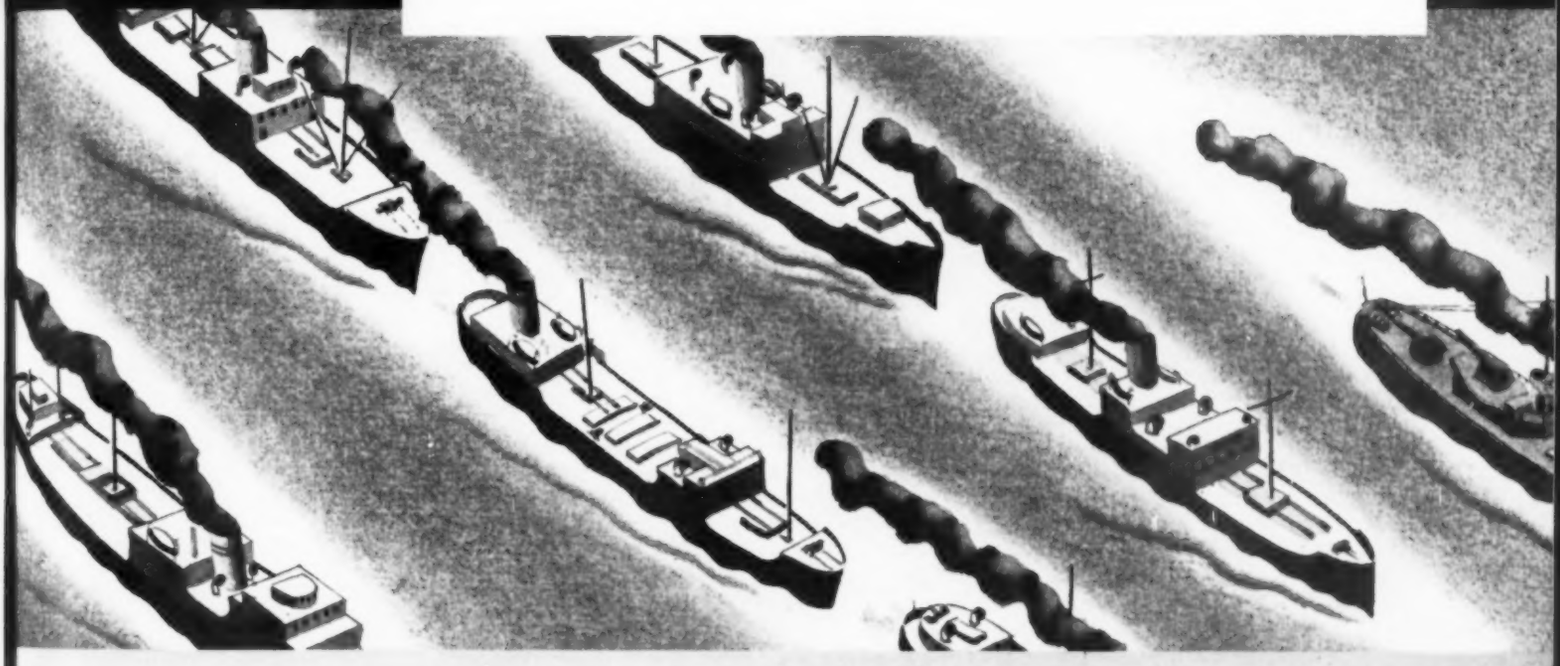
(*Continued on page* 94)

1


2

SHIP LANES *and* SHOP LINES

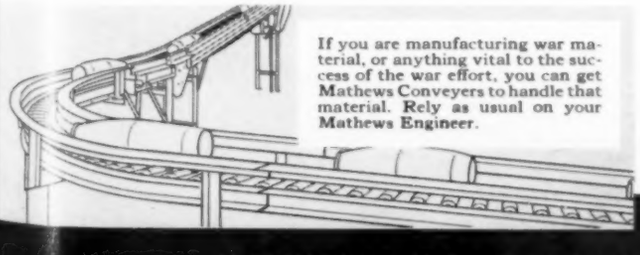




. . Both Must Be Kept Open!

MATHEWS CONVEYER CO.

Ellwood City, Penna.



If you are manufacturing war material, or anything vital to the success of the war effort, you can get Mathews Conveyers to handle that material. Rely as usual on your Mathews Engineer.

● MECHANIZED SUPPLY LINES WITHIN THE SHOP have solved many war production problems. Where Mathews Conveyer Systems have been installed, not only have shop and assembly lines been kept open . . . they have been greatly accelerated . . . machine-and-man-hour production has been improved . . . worker fatigue has been reduced! Mathews Engineers are working every available hour toward the improvement of American war production.

MATHEWS CONVEYERS FOR MECHANIZED PRODUCTION

(*Continued from page* 92)

bly is a little heavier than its aluminum counterpart, but a few design changes are expected to bring them down to a parity, perhaps even give a slight edge to steel. Steel is Ford No. 6 analysis, with high carbon and high silicon.

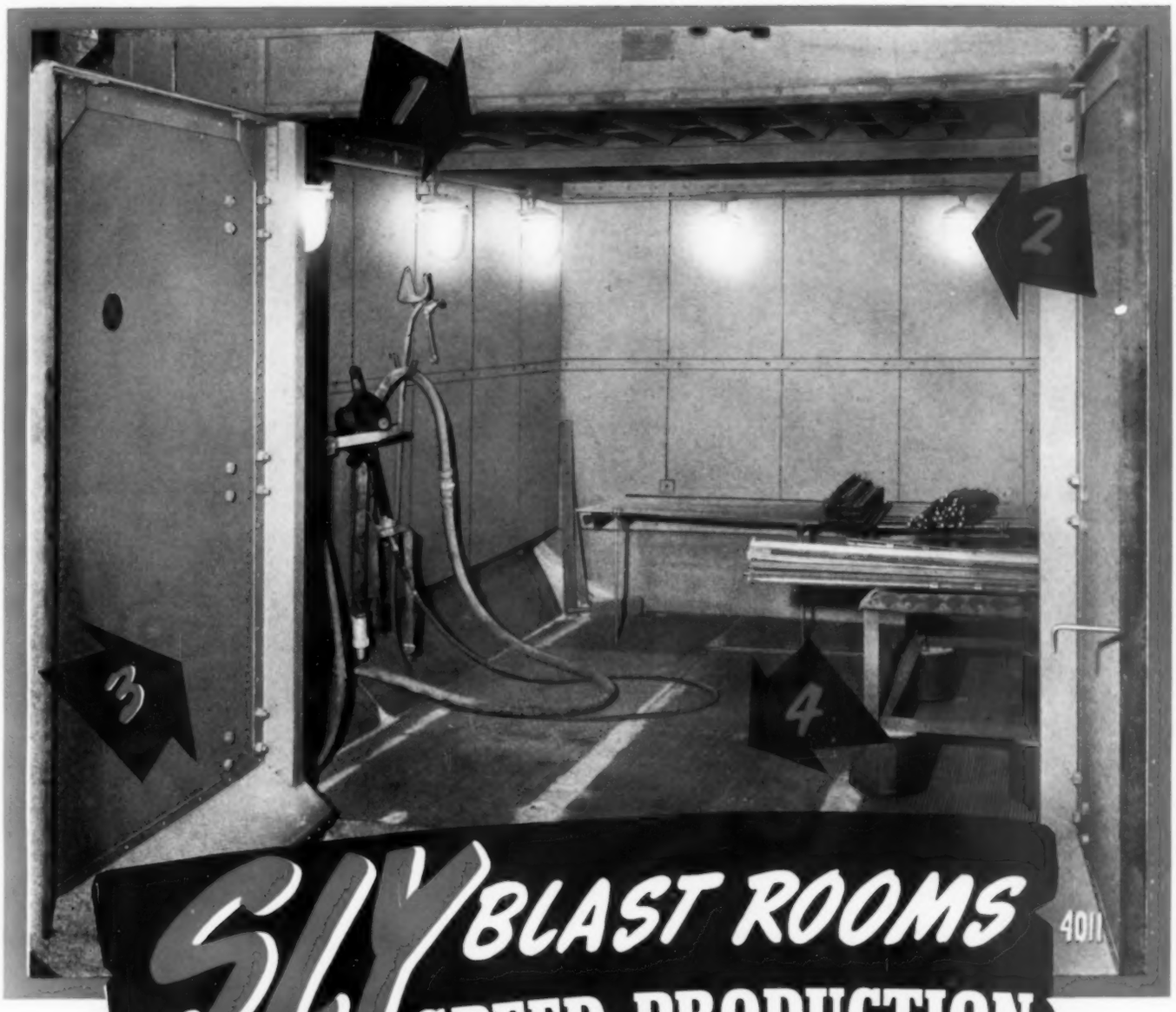
Fig. 3—A highly ingenious adaptation of centrifugal casting is shown in the landing gear pivot casting at the extreme right on the table in the foreground. Hitherto this part has been built up by welding 18 separate steel pieces into the units shown just to the left of the casting. The one-piece casting thus eliminates the need for the built-up assembly involving 15 feet of welding and at the same time is 3 pounds lighter. In tests the casting withstood a load far in excess of the design load. Because of the boss on one side of the part, the design does not have a symmetrical cross section; hence in centrifugal casting, the mold must be counterbalanced on the side opposite this boss. By this means the mold is brought into balance, except for the few seconds before it has been filled with molten metal.

On the table in the right background is a main strut axle casting which replaces a forging and saves 25 per cent of the tools and fixtures required in machining the forging. Much more metal is removed from the forging than is removed from the casting. On the other table are examples of plastics substituted for aluminum in nonstructural aircraft parts. In the right background is a single aluminum stamping for the pilot's enclosure on a large bomber, developed to replace a built-up assembly requiring scores of dies and fixtures.

Fig. 4—On table at the left are magnesium castings for rear cam support and crankcase blower in Ford-built airplane engines, showing new gating methods developed by foundry engineers to effect important savings in total amount of metal required per casting. This is shown more graphically on the table at the right where new and old methods of gating for reduction gear housing casting are compared. Note that the multiple risers of the old method now give way to one at the outside and one at the center, while pouring gate has been revised to embody three rectangular channels, for the purpose of minimizing swirling action of the molten metal with consequent dirt pickup. A reduction of over one-third in total pouring weight is achieved by the new method, with no sacrifice in soundness of the resultant casting. Between the two castings at the right is a "skull" of magnesium metal collected from a reduction retort at the Ford plant which is preparing to produce magnesium from ores by the ferrosilicon method.

Fig. 5—New types of gates and

(*Concluded on page* 142)



SLY BLAST ROOMS SPEED PRODUCTION

Exclusive features provide:

1 **BETTER VENTILATION** Triple ventilating ceiling insures unrestricted and uniform entry of ventilating air with downdraft ventilation throughout the entire area.

2 **BETTER LIGHTING** Special sturdy, dust-tight fixtures—and plenty of them—give abundant illumination.

3 **BETTER CONSTRUCTION** Doors and walls are of double construction, consisting of a rigid angle iron frame with 12 gauge plate exterior and $^{3}/_{16}''$ wear plate interior. These wear plates are easily replaceable.

4 **SAFER CONSTRUCTION** Grating and perforated plates are assembled in interchangeable sections, producing a floor that is thoroughly safe and highly efficient.

Complete information contained in specification sheets S-74 and S-75.

THE W. W. SLY MFG. CO.

4753 Train Avenue — Cleveland, Ohio

TUMBLING MILLS — SLY INDUSTRIAL DUST CONTROL — BLAST ROOM EQUIPMENT

HAMILTON FOUNDRY WINS AWARD

EMPLOYES of the Hamilton Foundry & Machine Co., Hamilton, O., were paid tribute May 29 during ceremonies in the plant auditorium when a representative of the United States Treasury Department presented the *Minute Man* blue flag, the first presented to any industrial plant in the city.

The flag was presented in recognition of the fact that 92 per cent of the employes are purchasing war bonds through a payroll allotment plan. Average investment for each worker per week is $3.23, which is $1.10 higher than the city average and represents 6.3 per cent of the company payroll.

Walter Rowe, chairman of the Hamilton war bond pledge campaign in presenting the flag to Peter E. Rentschler, president and E. M. Altman, personnel director of the company lauded the effort of the employes in not only doing an excellent job in turning out war materials, but also doing more than the average person toward financing the war. He urged them to keep up the good work. He then presented Mr. Rentschler with the "Roll of Honor" certificate showing that more than 90 per cent of the company employes are participating in the payroll allotment plan of purchasing bonds.

Mrs. Ruth Bonnefond, executive

(*Concluded on page* 142)

MOLTRUP

PATTERN PLATES
CORE PLATES
BOTTOM PLATES

1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
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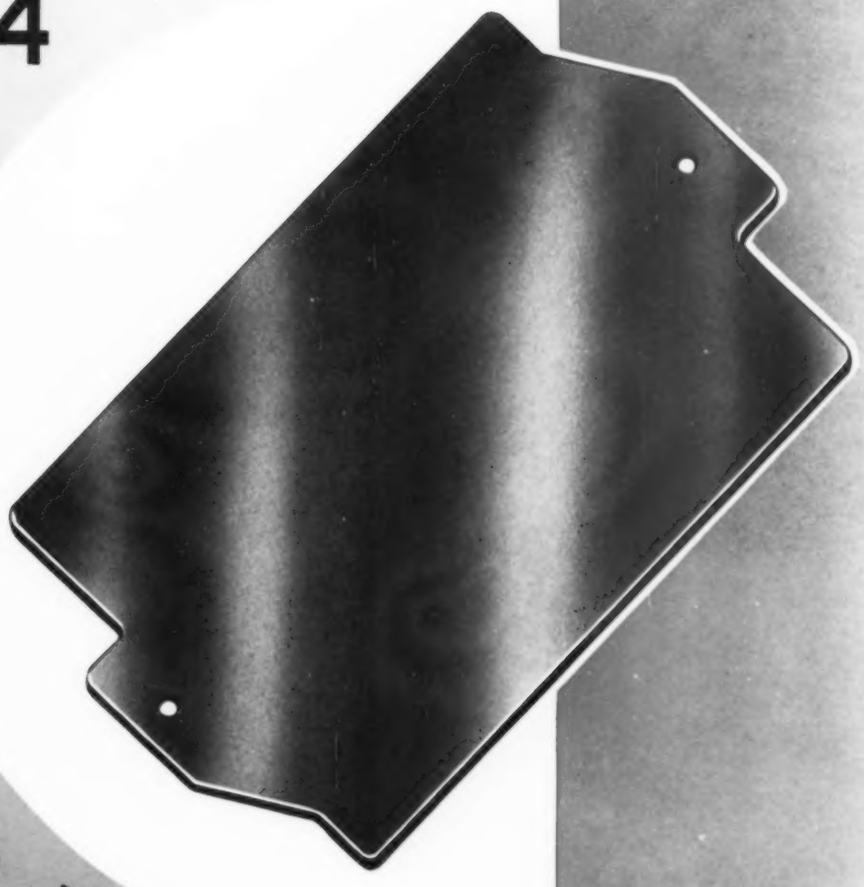
1958 1959 1960 1961 1962



THEY LAST FOR YEARS

REASONS WHY ON NEXT PAGE . . .

We are pleased to have released the front cover of this issue, to enable The FOUNDRY to reproduce the American flag.

STEEL PLATES

A NECESSARY PRODUCT IN ECONOMY-WISE FOUNDRIES... EVERYWHERE

Why?

- **AVAILABILITY**—Our production facilities have been geared to meet the increased demand of wartime foundry activity. Our STEEL plates are available on a reasonably prompt delivery basis, and can be made in any size or shape of plate required.
- **ECONOMIES**—Our STEEL plates are built to stay flat. Replacement is not a problem. Their long life *GUARANTEES* economy.
- **ADVANTAGES**—These plates are light, rigid, strong and absolutely flat. The process by which the plates are flattened is superior to rolling.
- **USERS**—Users of our STEEL plates consist of representative foundries throughout the country. There will be one near you. Write or wire us today for complete information.

MOLTRUP

MOLTRUP STEEL PRODUCTS CO., BEAVER FALLS, PA., PITTSBURGH DISTRICT

RECLAMATION PROCESS PROVES VALUABLE

SINCE establishment four years ago of its reclamation department by Caterpillar Tractor Co., Peoria, Ill. for full time concentration on a job that might be termed a by-product of manufacture, that department has grown into a unit so valuable that its worth cannot be measured solely by the dollars it saves.

Various types of machinery and equipment are required to carry on extensive activities of reclamation. These include a briqueting machine, scrap steel baler, hacksaw blade grinder, woodworking machine, ripsaw, cut-off saw, alligator shear, punch press and squaring shear.

The reclamation department now consists of several locations throughout the huge plant, strategically placed to eliminate extra handling of material to be salvaged or reclaimed. Those materials include metals, steel clippings, crop ends and trim, aluminum borings, steel turnings, gray iron borings, used machinery, tools, obsolete jigs and fixtures, cables, screws, grinding wheels, files, paint pails, hand pads, building material, crates, lumber, wood scrap, corrugated paper and even discarded advertising literature.

For example, some 1000 lead hammers for general factory use are made monthly from scrap lead, discarded grinding wheel bushings and old hammers.

Study of grinding wheels has led to many new uses for wheels, after they are taken off the machine for which they were purchased originally. By standardization of arbor holes it is now possible to use the same wheel on as many as three different machines and still provide them with the grain size and bond that is needed on each particular job.

Work of recutting is done by outside vendors, wheels are recut to size, counter bored, if necessary, and speed tested. By the changing of wheel designs a system of progressing wheels from one machine to another without added alterations has also been made possible. By increasing spindle speeds on a number of stand tool grinders, wheels can now be used down to the blotter.

Special steady rests have been designed to get the maximum out of the stand grinder wheels without loss of wheel efficiency. Worn abrasive disks are trimmed down to the

(*Concluded on page* 150)

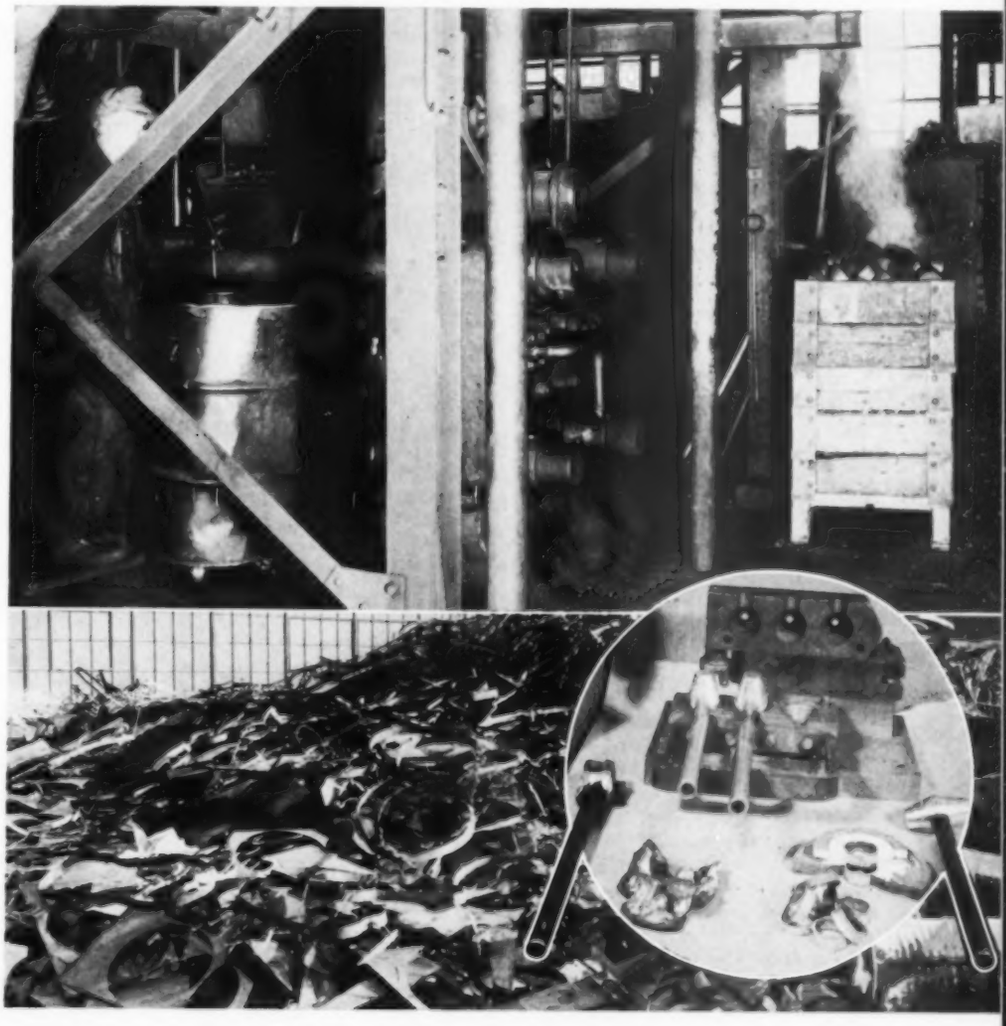


Fig. 1 (Upper right)—Gray iron borings are pressed into briquets. Fig. 2 (Right)—Miscellaneous light sheet, trim, skeleton, wire, etc. are converted into pressed bales for the foundry. Fig. 3 (Inset)—The department makes 1000 lead hammers monthly from scrap lead, discarded grinding wheel bushings, etc. Fig. 4 (Below)—Original grinding wheel at far left is 42 inches in diameter and used on three machines before discarding at 23 inches in diameter, right. Fig. 5 (Lower right)—Gray iron briquet and amount of borings required for its production

the adventures of Bill

BY PAT DWYER

Drawings By RICHEY

WOULD you be interested," Bill asked me the other night, "in a business proposition where you could invest a small bit of capital that would bring you large returns for the period of your natural life and in all probability would do the same for your children and your children's children for years and years, world without end, amen?"

"Certainly," I said. "Who would not snap at a bait like that? However, as a normally prudent and cautious individual I would appreciate a little more light on the situation. Also, knowing you as well as I do, I am a little—ah—what is the word? Leary, that's it. I am a little leary of any fortune making propositions. I am inclined to the opinion there is a nice long piece of string fastened to the apparently innocent, but obviously carefully baited hook. I might cite you 47 reasons for this opinion, but in the present instance one will suffice. If you know where this fortune is ready to be tapped, why should you pass the good word on to me, or for that matter to any other person, instead of grabbing the plum for yourself?"

"Well," said Bill, "I'll tell you. A real genuine philanthropist, one of nature's noblemen generously made me the offer and also very kindly indicated that the offer also could be extended to any of my friends. He was operating on a grand scale, but would accept an initial investment of $50,000. Later of course when I saw how the jack was rolling in, I could make further and real worth while investments. As he explained the proposition—"

"Fifty thousand dollars! Does this citizen know you?"

"Not when he wrote the letter, but I rather fancy he does now. Still-an-all, as my old uncle Malchi used to say ''Twas the divil an' all iv a handsome compliment.'"

"Since I have not the slightest intention of taking advantage of your generous offer, would I over step the bounds of discretion and ordinary politeness by asking for a little further information? Who is this dispenser of manna in the wilderness? Why should he select you as a beneficiary, and most remarkable reason of all, how do you suppose he arrived at the conclusion that you had a barrel of the filthy lucre laid away for a rainy day?"

"Since I don't know the answer to any of these questions, perhaps I had better begin at the beginning."

"At one time or another," I said, "I have heard the method praised very highly."

"What method?"

"Beginning at the beginning. While we are on the subject, it may not be out of place to direct your attention to two other standard rules for telling a story. When you having nothing to say, say it. When you come to the end of a story, stop."

"You could stop before you come to the end of many of your stories and no one ever would know the difference. However, that's neither here nor there as the apprentice said when the gaffer asked him where was the chaplet he had told him to put on the pipe core. Of course he meant by that—"

"I know what he meant. You seem to forget that I was an apprentice at one time."

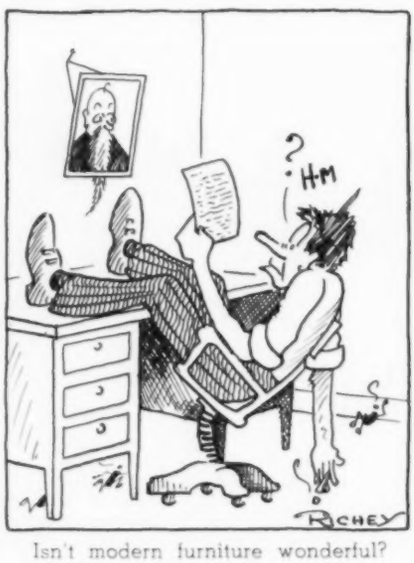
"One time is right. That was about the period referred to in all the fairy story books—'Once upon a time there was a little boy and his name was Jack'—a period somewhere in between the Noah's Ark deluge and the Johnstown flood. If little Jack kindly will keep his finger and his long nose out of this pie, we may finish this session before little Jackie's bed time.

"Once upon a time, in this instance early in April, I received one of the most remarkable letters ever sent through the mails. The envelope bore a Michigan post mark and in addition to the address carried a notation heavily underlined in the lower left corner, *Personal Important*. Extreme urgency was indicated on the back of the envelope "Return in 2 Days to Lock Box 94, Tom Bingo, Esq. Sales Agent. Established 1900.

"I had some trouble reading the letter sprinkled all over with capital letters and without a single punctuation mark from one end to the other. Here is a typewritten copy."

Dear Sir and Gentlemen I Have as Valued Clients well known Colorado and Montana Real Mining Men who wish want need Cash Capital & Equipment & Machinery for their Well Located Well Developed Mines of Lead Copper Zinc Gold Silver & Other Ores & Metals now in Demand and used by Big Manufacturers & Bussiness Men for and Bye Government Uses for Private Uses and War Defense & Private & Kindred uses for 1942 1943 1944 1945 Or for Duration of War now On If you have Clients Costumers or Friends who Can Finance & Furnish such Machinery as we might Need and Wish to Secure or Parties with Available Capital up to $50000 to Finance or Put off To Big Production 1 or More Mines I will be Glad to hear from You at Once and in Full So I can Give you Full & Complete Particulars & Make Needed Arrangements for You to Meet My Principals People & Clients For this Service I Thank you For your Cooperation & Quick Reply Resp Yours Tom S Bingo Sales Agt R CEC Financing Est 1900.

(*Continued on page* 102)



Isn't modern furniture wonderful?

Stop WASTING TIME

MonoRail loop at cupola assures quick distribution of metal to pouring floor.

★ Many foundry operations can show a substantial saving when handling jobs are done with American MonoRail Handling Equipment. Hundreds of foundries, completely equipped, are keeping materials on scheduled routes without delay, congestion, and damage in transit.

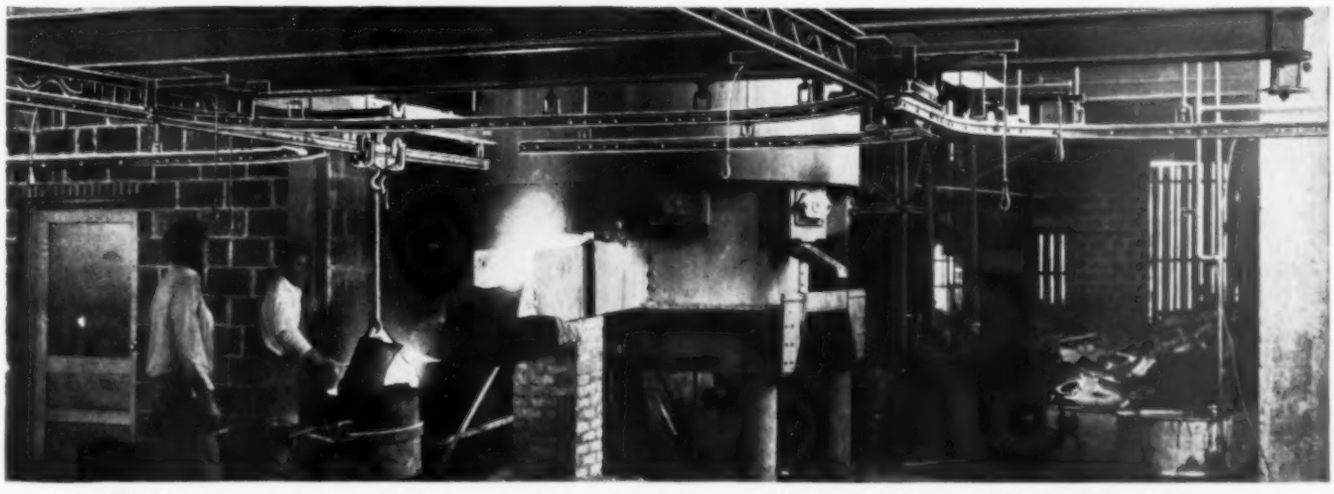
American MonoRail Equipment is particularly adaptable in foundry operations where speed, safety, efficiency and accuracy are of major importance. Let an American MonoRail system carry your product at the lowest possible cost and the highest possible efficiency. American MonoRail Equipment is supplied for manual, electric or automatic operation. No job too small, none too large. No interruption to your production during installation.

Why not arrange for an American MonoRail Engineer to survey your requirements, at no obligation?

THE AMERICAN MONORAIL CO.

13104 ATHENS AVENUE CLEVELAND, OHIO

Pouring made easy with Overhead Handling usually brings increased production.



Reduced employee fatigue—greater safety—made possible by MonoRail System

(*Continued from page* 100)

"I hope," I said, "you had sense enough to throw the letter away and pay no further attention to such a patently moronic and pitiful effort."

"Well," said Bill, "I'll tell you. That idea occurred to me, but on mature second thought I decided this potential crook was entitled to a good natured and friendly reply. I wrote him courteously as follows."

Dear Mr. Bingo: As nearly as I can gather the meaning from what probably is the worst example of hand writing ever set on paper, you are interested in securing the cooperation of manufacturers of equipment for a mining venture. You also would welcome investment of capital in the undertaking to the extent of $50,000.00.

It is possible my interpretation may not be accurate. I have been reading printed and written words for the past 60 years, but I do not pretend to omniscience. Frankly, the overwhelming dose of capital letters has me stymied and staggered.

Presuming that I have extracted your meaning in a general way, my reply to your urgent offer is a reluctant NO. I have not approached any clients, costumers (customers?) or friends because I am inclined to the opinion that they also would say NO.

All of which my dear Tom might be boiled down to the single modern vernacular gem "Nuts to you!"

"Very nice going," I admitted. "Did the embryo wolf in sheep's clothing rise to the occasion and come down like the well known Assyrian who came down on the fold, with cohorts gleaming with purple and gold?"

"No need of dragging Assyrians or other foreigners into this thing. Didn't I tell you this bird *Phenaglium Americano* lives in Michigan? I waited several days for a letter, or more likely a telegram or telephone call. When nothing turned I decided to do a little investigating on my own account. Fortunately I know a professor in one of the higher institutions of learning up in that part of the country. These professor lads know everything. I wrote him to see if he could give me the low down on this benefactor to the human race."

"I know in a general way," I said, "that you have a wide acquaintanceship with foundrymen, hoboes and home guards and with many other people in various walks of life, but this is the first intimation that you were on terms of intimacy with a university professor. These lads circulating in the rarified atmosphere of pure science are protected from contact with the rough outside world, especially with slick, sharp financial operators capable of and willing to lift the gold fillings out of one's teeth if one opens his or her mouth to enjoy a little yawn."

"You are thinking of the typical professor in the funnies, big heavy bullseye glasses, long patriarchal beard and a highly developed habit of stumbling around like a bumble bee in a half pint flask. Well, as in nearly all phases of common knowledge, you are wrong. The modern, snappy, alert and stream lined model gets around, my dear young fella. The bullseye glasses and the long beard have been tossed into the ash can along with the baggy pants, the claw hammer coat and the gates ajar collar. Off and on the campus the modern professor looks like one of the boys in a clothing catalog advertisement, nonchalantly holding a cigaret between dainty finger and thumb of one hand, while patting the head of a Russian wolf hound, 6 feet long, 4 feet high and 6 inches thick, with the other hand."

"Ah," I said, "I see it all. The professor put the wolf hound on the job and traced the villain to his lair."

"I did not say he had a wolf hound. I simply said he looks like one of these fashionable lads who show the common people how to wear clothes. However, that has nothing to do with the story. Listen. I wrote him a letter, to-wit, as follows."

Dear Dick

I had an urgent letter a few days ago from one Tom Bingo R. C. & C. Financing, Derrier, Mich. He has a sure fire money making proposition which needs only a modest capital investment of $50,000.00. An ticipated returns simply will be enormous. He generously is willing to include any friends of mine who may be interested. Quite naturally before I invest even this trivial portion of my ready cash, I should like to know a little more of Mr. Bingo, his history, social and financial background and all that kind of stuff. My nose is slightly blunted from daily contact with the grindstone, but I seem to detect the odor of a three letter word rodent, or traces of a wolf in the wood pile. Here is where you come in my dear young fella. Do you know anything or can you find out anything about this financial wizard? Certainly I shall appreciate your kindness and courtesy in taking a modest stab at this little problem.

"He probably wrote back that although he had a lot of miscellaneous letters after his name, he was not yet entitled to add F.B.I. He appreciated your confidence, but respectfully declined the honor and begged to remain yours most sincerely. He also probably added a post script "Nuts to you, with love."

"Nothing of the kind." Bill raised his open right hand and then brought it down in an eloquent and mildly contemptuous gesture. "As I pointed out some time back he may not be an F.B.I. man, a descendant of the Pinkertons, or a student of Sherlock Holmes or Ellery Queen, but he gets around. Just get an earful of this

" 'Dear Bill: I was very pleased

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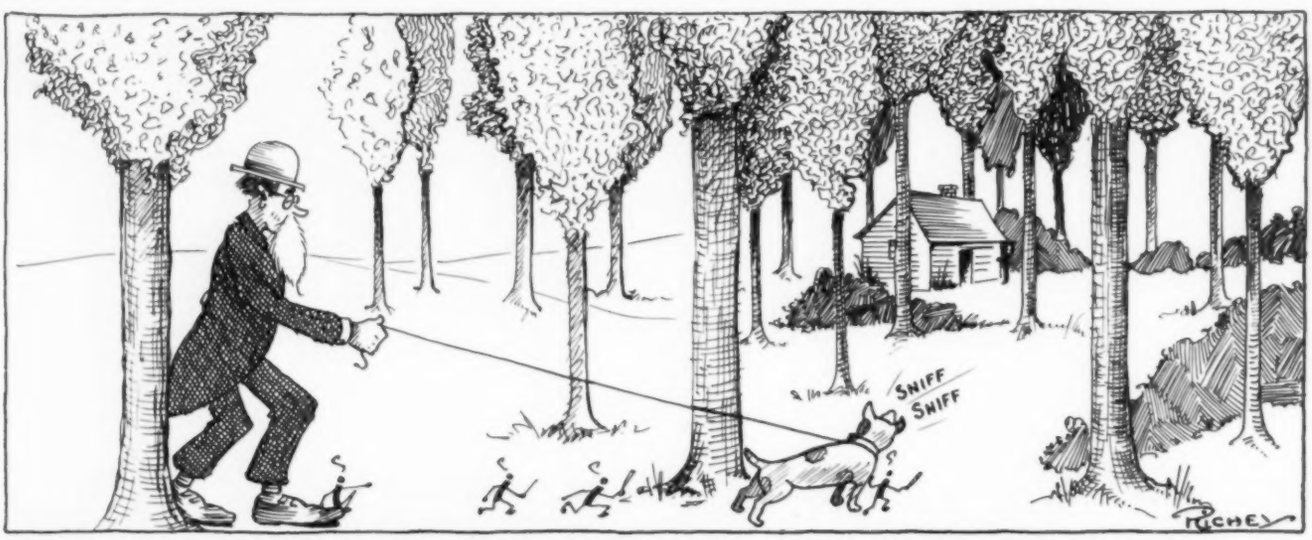


Slightly decayed financial odor points way to the den of the Ethiopian in the woodpile

Repeat Business

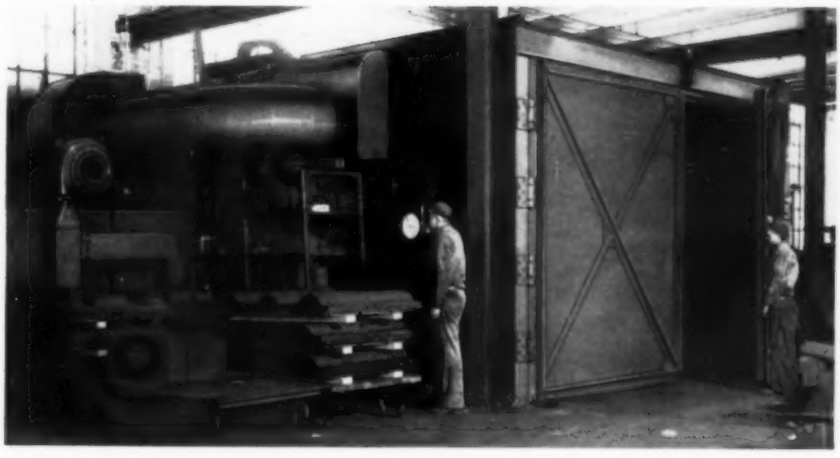
comes only from *satisfied customers*

ONE of the striking characteristics of this business is the number of sales made to oven users who have previously installed Young Brothers Ovens. And that was true even before the mad rush of war production, when plant executives had a wide choice of oven types and plenty of time to weigh performance, dependability, and economy with extreme care.

Today's changed conditions and restrictions have in some cases necessitated changes of fuel for oven operation. Such changes are always practicable with Young Brothers Ovens. Those installations illustrated here indicate how Young Brothers Ovens can be converted to coal or coke when other fuels are not economically practicable.

Young Brothers build all types of ovens (shelf, drawer, lift rack, car and conveyor types) for any type of fuel and for all kinds of baking and low temperature heat treating operations.

Young Brothers engineers are authorities on oven practice. They are ready to consult you on oven operations on any kind.



YOUNG BROTHERS CO.

INDUSTRIAL OVENS FOR ALL PURPOSES

6508 MACK AVENUE • DETROIT, MICHIGAN

Branch Offices in principal Industrial Cities

In California at: 277 SEVENTH STREET, SAN FRANCISCO and 406 SOUTH MAIN STREET, LOS ANGELES

ROTO DRAWER

GAS FIRED CORE OVEN

A STANDARD UNIT DELIVERED COMPLETE

TEMPERATURE CONTROL

The automatic control of the temperature of rapidly circulated and recirculated air insures a uniform temperature throughout the entire baking chamber—thus making possible a **STEADY FLOW** of cores perfectly baked in less time than ever before possible.

SMOOTH DRAWER OPERATION

The drawers, being entirely supported by externally mounted bearings, operate so easily and smoothly that all possibility of broken cores is eliminated.

DRAWER CAPACITY

The three large drawers are 8′-0″ diameter and have a capacity of over 1500# of cores 14″ high. The removable drawers are furnished either 4′-0″ diameter (as shown) or 8′-0″ diameter.

With a ROTO-DRAWER you need have no more BURNED CORES

THE CLEVELAND BLOW PIPE & MFG. CO.

6505 CEDAR AVE. **CLEVELAND, OHIO**

Foundry Developments at short range

IN anticipation of a possible blackout order an eastern steel foundry has mounted a rolling metal curtain between two crane columns in front of the electric furnace. Under normal operating conditions the curtain is rolled up out of the way to permit entrance and exit of the ladle under the spout of the furnace. Space between two columns on either side is blacked out with a similar curtain left constantly in place. Stacks from other furnaces in the plant are provided with large hoods to conceal flames and glare.

* * *

Casting rejects caused by dust and sand settling into molds in a magnesium foundry were claimed to be eliminated by installation of a new heating and vetilating system which controls the amount, direction and rate of air delivered. Heating units are mounted nine feet above the floor level along the side walls. Long slotted outlets fan low velocity air downward and toward the center of the floor at the correct temperature to offset heat losses through the ventilators.

* * *

Restricted supply of bentonite in the British Isles due to wartime conditions has led to a search for substitute materials, and F. A. Fox writing in our overseas contemporary, *Foundry Trade Journal*, describes some tests using fullers earth as a molding sand bond. Silica sand bonded with 4 per cent fullers earth was employed and the sand showed 2.75 per cent moisture, 6.1 pounds per square inch compression, and 125 permeability A.F.A. units as against a bentonite bonded sand values of 3.2 per cent moisture, 5 pounds per square inch compression, and 100 permeability A.F.A. units After two months continuous use during which the sand was milled about 40 times the figures were 3.3 moisture, 8.8 pounds per square inch compression, and 101 permeability A.F.A. units. According to the author the sand behaved satisfactorily during the tests.

* * *

Rapid and easy cleaning of aluminum alloy core dryers to remove the carbonaceous and other coatings resulting from the baking of the core binder is claimed to be accomplished by immersion for a few minutes in a solution containing a liquid silicate. As little as 1 part of the silicate in 30 parts of water does the work without attack on the aluminum. Following immersion the core dryers are rinsed with water, and are ready for use. For cleaning of iron and steel dryers a granulated silicate can be employed since those materials will withstand a more vigorous detergent.

* * *

A prominent steel foundry equipped with electric furnaces and engaged in the manufacture of bomb shells about 13 inches in diameter and 4 feet in length, does not pour any metal left in the ladle into pig molds, either sand or metal. One or two rejected shell castings are set up in a vertical position with the open end on top. Superfluous metal is poured in until the shell is filled. Then the solid block of steel is lifted and charged into one of the electric furnaces.

* * *

SHORTAGE of tin for the production of tin-bronzes has led to the increasing use of the silicon bronzes. One type of silicon bronze for ordinary structural castings contains from 1.4 to 4.0 per cent silicon; 0.5 to 3.0 per cent iron; not more than 4.0 per cent zinc; not more than 1.5 per cent manganese; not more than 0.2 per cent phosphorus, and the remainder copper. For bearings for extreme loads and bell metal the silicon is raised to 8 per cent and the iron to 3.5 per cent; the other elements remaining the same. Another type of silicon bronze contains about 95 per cent copper; 4 per cent silicon, and 1 per cent manganese.

First type is made by the addition of a hardener to copper while the second is available in the form of notched ingots. Both types are melted preferably under a broken bottle glass flux. Molding sand should be fairly open, and gating and risering should be ample to take care of shrinkage which is not quite as great as for manganese and aluminum bronzes.

A third type of alloy which may contain considerably more zinc than the others mentioned previously comprises a series of alloys falling within the range of 80 to 98 per cent copper; 0.5 to 6 per cent silicon and 1 to 19 per cent zinc. The alloys are available in ingot form with definite composition limits to meet specific applications. One type is said to be especially applicable to running intricate and thin-section castings.

* * *

SEALING solutions of two types are available for reclaiming nonferrous castings which are porous. One is a heavy type containing a filler for castings where the porosity is somewhat open, and the other is thinner for fine porosity. Method of use is to fill the casting with the desired solution and apply air pressure to force the solution into the pores for a period ranging from 5 minutes to an hour. The solution is dumped out, and that remaining on the surface can be removed with denatured alcohol if desired. Then the casting is baked at 175 degrees Fahr. for one hour to remove the solvent, and then the temperature is raised to 250 to 275 degrees to polymerize the resin. Time required for that operation may range from 2 to 5 hours depending on the size of the casting and the kind of oven used.

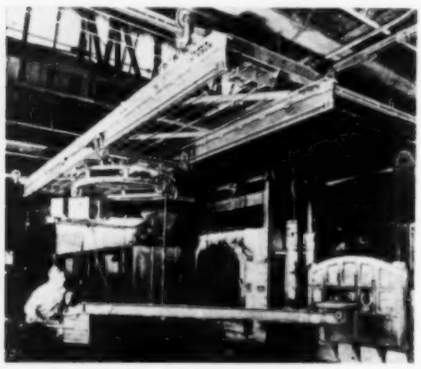
* * *

In a prominent steel foundry where dry sand cores are used extensively in large molds a useful shop kink has been developed for making adjustments in the length of stud chaplets. A small discarded hand operated hydraulic press is mounted on a convenient stand about waist high. A ball of clay is forced into the position the chaplet is to occupy. This ball then is placed on the anvil of the press with a chaplet alongside. The plunger is brought down and the chaplet is squeezed until the plunger touches the clay guide. The only deformation is in the chaplet stem which becomes thicker in proportion to the amount of pressure exerted. This method of slightly compressing a long chaplet is preferable to placing a shim or shims on a short chaplet.

new equipment and supplies

Quenching Crane

American MonoRail Co., 13107 Athens avenue, Cleveland, has developed a revolving type monorail crane, as shown in the accompanying illustration, designed to handle moving of annealing pots from furnace to quenching tanks in quickest possible time. Serves a compact area containing four or more furnaces set by pairs at right angles facing the quenching apparatus.



One man operates the crane by hand with a ½-ton electric hoist to raise or lower a 900-pound counter weight and picks up or drops the 400-pound pots or containers. The 7-foot arm for reaching into the furnace is mounted by porter bar on swiveling truck with hoist at the opposite end. This allows rapid swinging of load into position for quick deposit in the quenching device. Swivel movement, also movement across bridge and entire crane on runway is by hand on trolleys provided with precision bearings.

Acid Pump

The Duriron Co. Inc., Dayton, O., has developed a new series of corrosion resisting pumps in which it is claimed to be possible to get 480 combination of alloys, types and sizes with heads and capacities to meet practically any requirement. Pumps made in the high silicon irons can be converted to stainless steel pumps by substituting only the wet end parts without disturbing the setting of the pump. This convertible feature is said to be especially valuable where there is apt to be changes in the liquid handled. For example a duriron pump for unloading acid tank cars can be converted to stainless steel for pumping caustics. Other features include interchangeability of newly designed open and closed impellers with negative pressure on the stuffing box; over size ball bearings throughout and micro-adjustment of the impeller to obtain maximum efficiency.

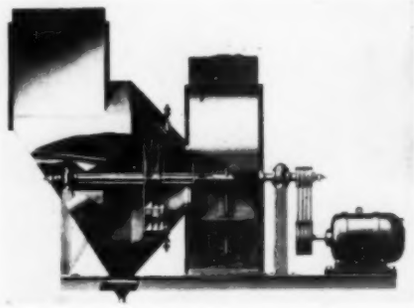
Respirator

American Optical Co., Southbridge, Mass., has developed a respirator for protection against toxic dust, stated to be light weight and to give full vision. The entire face piece is a filter which com-

presses maximum protection area in minimum space. The closely felted filter has been approved by the United States Bureau of Mines for protection against inhalation of toxic or poisonous dusts from lead, cadmium, arsenic, manganese, selenium, vanadium and their compounds. The easily adjusted face piece with leak sealing cantilever edges of pliable rubber gives face fitting comfort. The simple nonreversing exhalation valve is designed to give positive protection. The double head band of solid sanitary rubber holds the 1½ ounce respirator in place without tension.

Exhaust Fan

Claude B. Schneible Co., 3593 Lawrence avenue, Chicago, has placed on the market a new exhaust fan, shown in the accompanying illustration, which is designed for removing dust from hot corrosive stack or cupola discharge through a specially designed rejector wheel. Solid particles are thrown out while hot air and gas pass through openings in the rejector and are exhaust-



ed by the fan. Units are available in seven sizes up to 26,000 cubic feet per minute and readily can be worked into any stack condition.

End Brush

Osborn Mfg. Co., 5401 Hamilton avenue, Cleveland, has developed a new type end brush shown in the accompanying illustration. This brush is designed particularly to clean slag, scale or oxidation from welds or inside corners or other locations difficult of access. The new brush can be used in all standard power tools, air or electric. A special holder permits quick replacement of the brush part. The brush is only ½ inch across the end and is available in three wire diameters, 0.025, 0.035 and 0.90-inch.

need some help with your

CRUCIBLES?

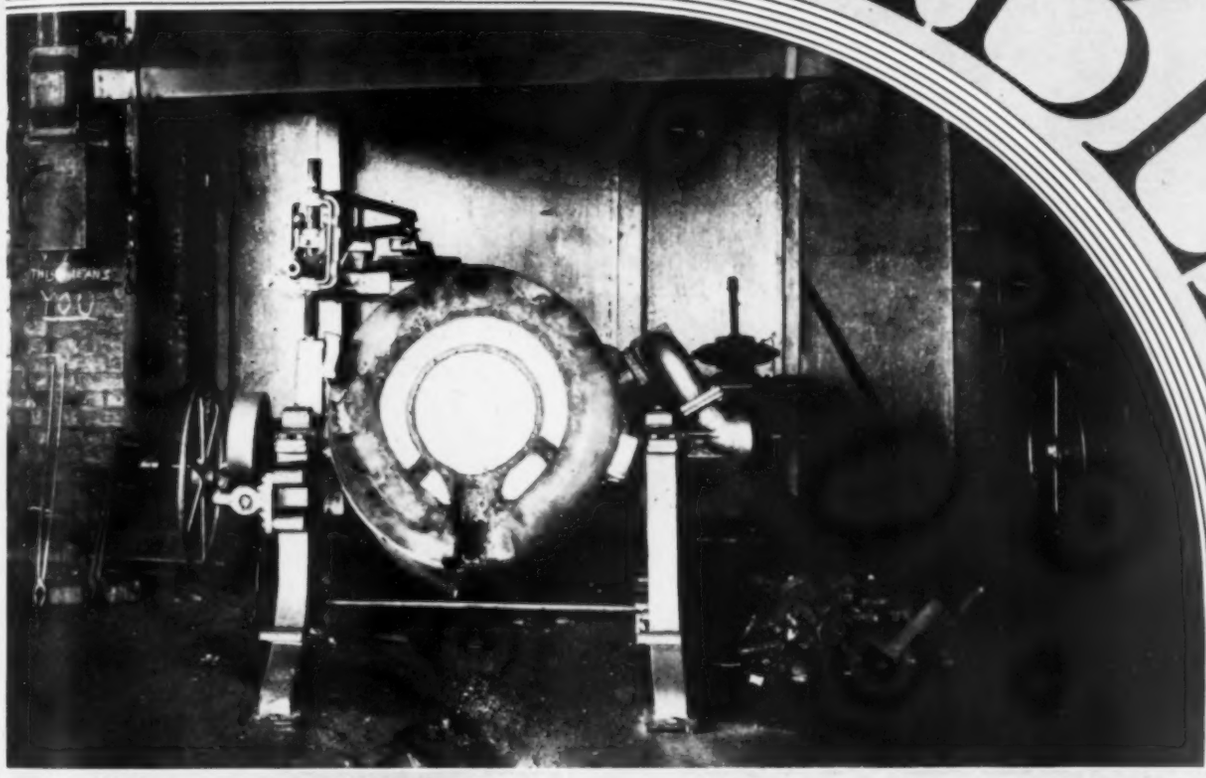
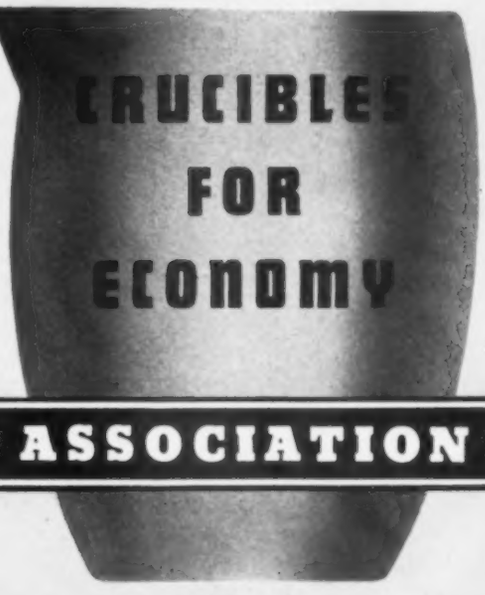


Illustration shows tilting furnace fitted with No. 225 Long Lipped Crucible. Note how crucible is blocked in place—only in the front—on either side of the lip. This is the best recommended practice. This furnace is fired with city gas and the burner is equipped with a proportional mixer. This keeps the air-gas ratio constant and definitely adds to crucible life. Photo courtesy Campbell-Hausfeld Company.

Has the increased work in your foundry created a crucible handling problem? Are you having storage troubles? Are your crucibles lasting as long as they should? Are your operating men fully informed on crucible care and furnace operation? Why not be sure. . . . by calling on the Know-How-Information of the crucible or furnace manufacturers? Also write to the address below and ask for—"How to cut crucible costs." It's full of information on the care of crucibles.



CRUCIBLE MANUFACTURERS ASSOCIATION

90 WEST STREET, NEW YORK, N. Y.

Smoke Alarm

Photoswitch Incorporated, Cambridge, Mass., has developed a new smoke alarm device which it is claimed increases combustion efficiency by indicating the degree of smoke density in the stack. The

equipment includes photoelectric control, light source and indicator and signals efficient combustion, or excess smoke on green and red signal lights. Lens system mounting minimizes possibility of soot and dust deposit. Through suitable wiring the densometer shown in the accompanying illustration, may be mounted at any convenient point for observation.

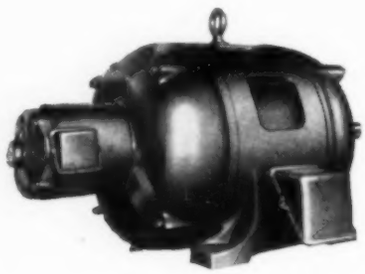
Tool Grinder

Hammond Machinery Builders, Inc., Kalamazoo, Mich., has developed a new, faster and more accurate carbide tool grinder, available for either dry or wet grinding, built in two models, cup wheels on both sides, or cup wheel one side and straight wheel on the other side. Tables are controlled mechanically and angular setting is obtained by a hand wheel graduated to degrees. A crank handle moves the table in or out from the wheel. Uniform distance between operator and wheel face is maintained by

the coordinated movement of the wheel hood and sludge pan with the table. The table surface is grooved to keep the table clean and to facilitate tool movement. Replaceable steel wearing strip 1¼-inch wide is inserted in the table next the wheel. The machine is 56 inches wide, 50 inches high and 32 inches deep with a table 12 x 22 inches. A new compound protractor tool gage has been developed for use on table. It not only slides in the table slot parallel with the wheel, but it also has a cross slide for moving toward the wheel. The cross slide permits use of the protractor when grinding parallel or at a slight angle with the tool. Protractor provides angles from 0 to 90 degrees. The coolant pump for wet grinding is powered with a ¼-horsepower motor. The wheels are driven by a 3-horsepower reversing motor and multi-V-belt. Spindle speed is 1350 revolutions per minute and wheel speed is 5000 surface feet speed per minute. Spindles are over size and bearings are protected by positive oil-water and labyrinth seal.

Field Generators

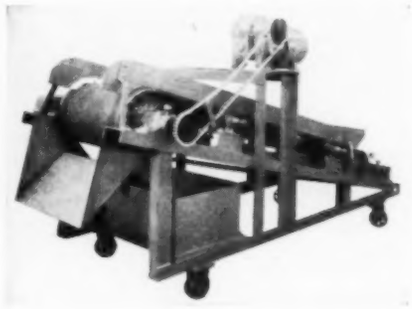
Century Electric Co., St. Louis, offers new compact, stream lined, revolving field, alternating current generators, in sizes from 7½ to 75 KVA, 4, 6 or 8 pole, 1800, 1200 or



900 revolutions per minute, 60 cycle (corresponding speeds for other frequencies) for belt or coupling drive or flange mounting. The new generators for continuous duty in isolated plants, or to supplement other available power supply, are wound for the various standard voltages, single phase 2 and 3 wires, three phase 3 and 4 wire or two phase 4 wire. The neutral may be brought out for three phase 4 wire systems for light and power. They are built to meet AIEE and NEMA voltage regulation standards. An automatic voltage regulator generally is used for best lighting service where the load fluctuates through a wide range. They can be designed for any desired value of power factor, but the regulation will be governed by the power factor.

Separator

Dings Magnetic Separator Co., 675 Smith Street, Milwaukee, announces a new special inclined portable pulley type separator, shown in the accompanying illustration, which can be supplied complete with motor drive and if necessary with motor



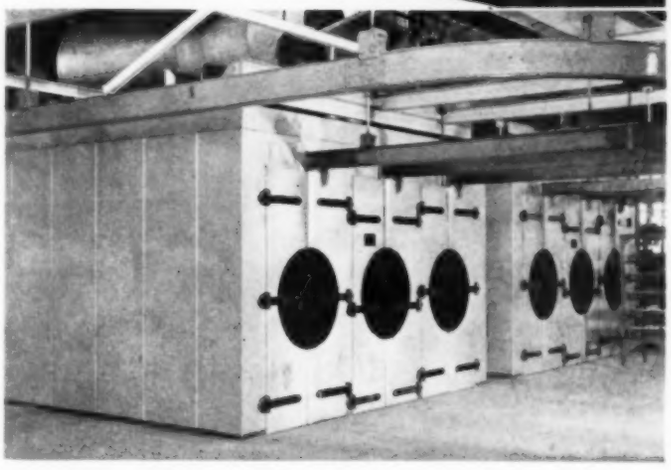
generator set. It is claimed the inclined design makes it easy to shovel material on to the endless belt at one end and the discharge at any required height at the other end into bins, trucks or other destination. It is stated that while this machine may be used in practically every industry for removing iron from all materials, it is most applicable in foundries for cleaning sand and in the metals refining industry for reclaiming and purifying nonferrous scrap. In this unit the head drive pulley is a high intensity, air cooled electro magnetic pulley with bronze coil covers.

Electric Cranes

Harnischfeger Corp., 4400 West National avenue, Milwaukee, has introduced two new features as standard equipment on the type of cranes known as Trav-Lift. All double I-beam cranes employing a motor driven trolley will be equipped with a drag brake on the trolley. All cage controlled cranes will be equipped with a foot gong. These cranes are available in capacities up to 15 tons and are claimed to be adapted for intermittent service and for supplementary use with the large overhead traveling cranes made by that company. It is claimed these cranes can be used to speed production with safety and economy.

SCRAP DOESN'T HELP THE WAR EFFORT

...when it comes from rejected castings!



Part of a battery of twelve Carl-Mayer Gas Fired Recirculating Type Core Ovens, in an outstanding foundry, featuring amazing uniformity only achievable with a Carl-Mayer heating system.

● Every casting scrapped because of improperly baked cores means a slow-down in the delivery of vital parts needed in war production, therefore every precaution must be taken to insure most efficient oven performance.

MAKE CARL-MAYER OVENS YOUR FORTE!

Their exclusive recirculating air heater systems mean dependable core baking and mold drying, day in and day out—at a 25 to 50% saving in time and fuel or better.

Built in all types and sizes, and for all fuels. Wire for a Carl-Mayer Engineer or write for Bulletin 141.

OVER TWENTY YEARS' EXPERIENCE

THE CARL-MAYER CORPORATION
3030 Euclid Ave. Cleveland, Ohio

BAKE CORES, DRY MOLDS *with* SPEED *and* SAFETY *in*

CARL-MAYER OVENS

CARL-MAYER CORE AND MOLD OVENS SERVE CONCERNS LIKE THESE:

ALUMINUM CO. OF AMERICA
AMERICAN MAGNESIUM CORP.
AMERICAN RADIATOR CO.
BABCOCK & WILCOX CO.
BUCYRUS-ERIE CO.
BROWN INDUSTRIES CORP.
DUNKIRK RADIATOR CO.
ECLIPSE AVIATION DIVISION OF BENDIX AVIATION CORP.
ELECTRIC AUTOLITE CO.
FORD MOTOR CO.
FOX FURNACE CO.
FORT PITT STEEL CASTING CO.
FRANK FOUNDRIES CORP.
FREMONT FOUNDRY CO.
G & C FOUNDRY CO.
GENERAL MOTORS CORP.
GENERAL ELECTRIC CO.
GILBERT & BARKER CO.
INTERNATIONAL HEATER CO.
LECTROMELT STEEL CASTING CO.
OHIO INJECTOR CO.
PACKARD MOTOR CO.
SHENANGO PENN MOLD CO.
STUDEBAKER CORP.
UNION METAL & MFG. CO.
WHITEN MACHINE WORKS
WHITING CORP.

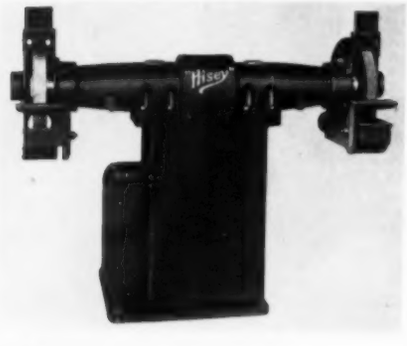
Grille Jet

Illinois Testing Laboratories, Inc., Chicago, offers a new intake air exhaust grille jet, developed for use with a velocity meter. The jet has two calibrated openings; one at the end of the main member which forms a compensating tube and extends from the grille face outward from or beyond the critical suction zone, the zone where the

air pressure changes most rapidly from static to velocity. A calibrated branch tube at right angles to the main member is attached to a flexible tube connecting the jet to the velocity meter. The air actuating the meter movement is inspirated through the branch tube by the force of the suction exerted upon the main member or compensating tube. The jet is offered in two sizes, low velocity $\frac{5}{8}$-inch outside diameter tube for full scale ranges up to 1000 feet per minute, and high velocity of $\frac{3}{8}$-inch tube for scale ranges up to 2500 feet per minute and higher.

Grinder

Hisey-Wolf Machine Co., Cincinnati, has developed a wide swing grinder shown in the accompanying illustration and for which is claimed the outstanding advantage of large spacing between wheels and the almost unlimited working clearance around the wheels to permit grinding large, awkward, and irregular shaped objects. Motor is mounted on rear of the pedestal and a v-belt drive operates the spindle. For buffing and polishing applications the machine can be furnished without the guards over the wheels. The guards pivot to any angle, have



hinged covers and standard exhaust pipe connections. Manual push button starter is standard equipment. Magnetic starter can be furnished to order.

Chipper's Guard

Industrial Gloves Co., Danville, Ill., recently has placed on the market what is claimed to be a practical, comfortable, long wearing guard for chippers. The new safe guard is heavy chrome tanned cow hide split leather designed to withstand unusually heavy service. Open end of the mitten permits full use of the fingers. Guard is reinforced where wear comes on palm and back with extra leather patch. The glove is insulated with wool heat breaker. Back of thumb also is reinforced with extra leather. The new glove

which can be worn over a glove or the bare hand can be supplied in pairs, all lefts, all rights or any combination of lefts and rights at no additional cost. For extra wear the gloves are double sewed throughout.

Blackout Paint

Hilo Varnish Corp., Brooklyn, N. Y., has developed a blackout paint which it is stated conforms to the specifications of the camouflage committee of the National Paint and Varnish Association. The paint which blacks out fluorescent and other lights is waterproof and may be used inside or outside. Flows out to a smooth, even, dull finish and requires only one coat. Resists heat up to 212 degrees Fahr. Covers approximately 500 square feet per gallon according to the smoothness of the surface. Dries to touch in 15 minutes and is hard in 2 hours. Can be be removed with kerosene or other mineral solvents. The paint may be brushed or sprayed as it comes from the can without any further preparation.

Telephone Booth

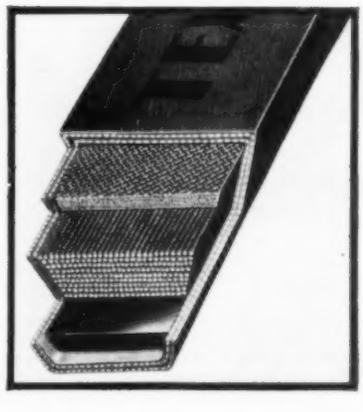
The Burgess Battery Co., Acoustic Division, Chicago, has developed a new line of telephone booths constructed of heavy reinforced birch plywood. Walls and ceiling are perforated reinforced panels filled with sound absorbent material. The booth has no door. It is claimed that factory noise is completely absorbed thus assuring perfect con-

versation reception inside and privacy from the outside. Open, doorless construction insures perfect ventilation. Rounded corners and other features prevent undue marring in busy shop or factory. A shelf is provided for the telephone instrument and for taking notes. Illumination is provided by an overhead electric light. Outside dimensions of booth, 30 inches wide, 79½ inches high, 38 inches deep.

Laminated V-Belt

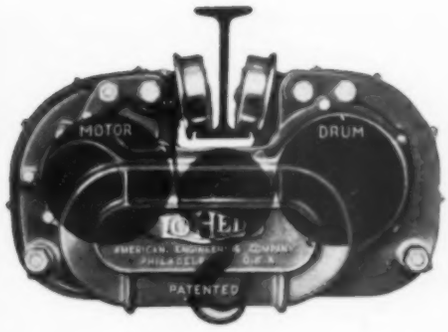
Allis-Chalmers Mfg. Co., Milwaukee, announces that all its texrope V-belts now are a new laminated design. The cords are smaller. More cords per belt are said to result in greater strength and less stretch. A live bottom rubber cushion absorbs the operation impacts. The central cord portion

(*Concluded on page* 113)



IT'S EASY WITH

Balance

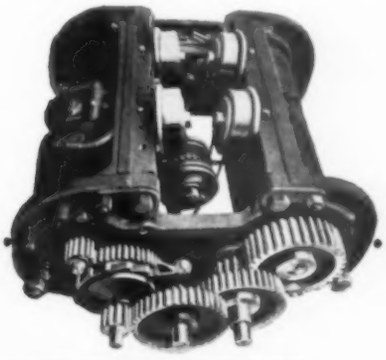


And it's easy to see why BALANCE is important in an electric hoist

The other day one of our hoist engineers said to us: "In our advertisements we've talked a lot about the balanced design of the Lo-Hed hoist, how it achieves minimum headroom (for which no premium is charged), and allows us to use an efficient all-spur gear drive.

"I think we ought to tell people that balancing the motor and drum about the beam also enables us to design short, strong shafts that minimize torsional stresses and reduce the chances of failure. We might also say that the unique balanced construction of the Lo-Hed hoist permits the use of covers that can be removed with a screw driver to gain access to the motor, brake, cable or drum . . . good points in these times.

"And don't forget that though more Lo-Heds are built today than ever before they are as carefully precision-machined as they were in normal times. A Lo-Hed bought now for war work is an investment in the future." All right, Mr. Engineer, since you've said it all for us, we'll sign off by simply asking the reader of this ad to send in for his copy of the Lo-Hed catalog.



AMERICAN ENGINEERING COMPANY

The Lo-Hed Hoist Is Applicable To Any Monorail System
There's A Balanced Lo-Hed Electric Hoist For Every Purpose

Look in your Classified Telephone Directory under "A-E-CO LO-HED HOISTS" for your nearest representative

OTHER A-E-CO PRODUCTS: **TAYLOR STOKERS, MARINE DECK AUXILIARIES, HELE-SHAW FLUID POWER**

AMERICAN ENGINEERING COMPANY
2418 Aramingo Avenue, Philadelphia, Penna.

☐ Please send me your complete catalog of LO-HED HOISTS
☐ Ask your representative to get in touch with me promptly

Name _____

Company _____

Street Address _____

City _____ State _____
(Please Print Plainly)

SPEED UP . . speed up . . speed up - if you want speedy victory! Every foundry in America has the same responsibility for turning out castings faster - and better - than ever before! This is why you will find more foremen checking up regularly on their old grinding wheels to determine if greater production isn't possible.

In direct contrast to the high cost of installing new machinery to snap up production, new grinding wheels especially designed to solve your problems are not expensive, and will account for more production per hour from every workman in your snagging and other grinding departments. The solution of your problems is a matter of short consultation with a Sterling engineer.

HOW TO MAKE WHEELS LAST LONGER AND DO BETTER WORK!

- Bring wheel against work gently. Sudden impacts often break wheels . . . always cause excessive wear!
- Do not grind with the edge of the wheel. Use the entire wheel face . . . it is faster, more efficient!
- Use the correct wheel for each job.
- Keep all grinding equipment in constant repair.

Sterling engineers are qualified by years of experience in foundry grinding practices to recommend the type of wheels you need. Write for this service today, and you will be scheduled for an immediate call at no obligation.

In the meantime, send for Sterling Catalog No 42. It contains a wealth of grinding wheel information, and costs you nothing.

• STERLING ABRASIVES •

THE
STERLING GRINDING WHEEL DIVISION
OF THE CLEVELAND QUARRIES COMPANY
TIFFIN, OHIO

THE WHEELS OF INDUSTRY

(*Concluded from page* 110)
transmits power at the effective pitch diameter. The bias cut fabric prevents dishing and assures transverse stability. The 2-ply rubber impregnated fabric cover prevents destructive agents from reaching the vital belt elements, resulting in a high grip coefficient between belt and sheave walls.

Milling Machine

Jefferson Machine Tool Co., Fourth, Cutter and Sweeny Streets, Cincinnati, has made several design changes on its motor driven precision milling machine. This machine is claimed to combine speedy and accurate production with ease of operation and long service. Spindle is mounted in tapered roller bearings. Slides are dove tailed, gibbed and hand scraped. Gibbs are adjustable to take up wear. Machine is driven by v-belts for four spindle speeds, 200, 400, 700 and 1000 revolutions per minute. A quick adjustment lever maintains constant maximum pulling power and automatically releases in case of over load. The machine also is furnished with variable speed unit, and can be supplied with coolant pump and tank in base.

Transformer Welders

Wilson Welder & Metals Co., New York, has developed a new line of alternating current transformer welders in 300, 500, 750 and 1000 ampere capacity, completely self contained units designed to meet heavy arc welding needs of shipyards, railroads and steel mills. Available for use with 220, 440, or 550 volts, 25 to 60 cycle current.

When arranged for 220 and 440 volt operation, single phase, either voltage can be brought into use by reconnection of the leads brought outside the unit. Continuous stepless current regulation is arranged through a hand crank on top of the machine. All coil covering is spun glass fiber, heat resistant, class BB insulation providing trouble free operation even when used continuously at maximum setting. On 60 cycle units all sizes are fan cooled except the 300 ampere size cooled by natural draft. On the 25 cycle units all sizes are cooled by suitable built in fans.

Skid Platform

The Yale & Towne Mfg. Co., recently has placed on the market a specially constructed skid platform in which a new interlocking wood weld process ties supporting leg runners and deck boards into a solid unit. Deep grooves extend the full length of the platform deck boards.

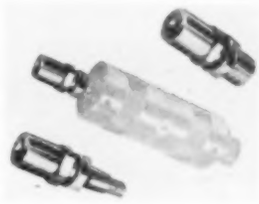
The supporting hard oak leg beam is fitted into the grooves. The vise like grip is claimed to eliminate rocking, and shaking. Beam and deck are joined with specially cement coated spiralled helical nails. Steel legs are joined to the beam by heavy forged steel bolts. The new skid platform is available in all standard widths and lengths, plain or armored end; vertical or standard leg design, four or six leg construction.

Hard Facing Rod

Stoody Co., Whittier, Calif., has developed and is marketing through the Air Reduction Sales Co., New York, two new hard facing alloys for application by welding. Type K is a cast rod consisting of molybdenum, tungsten, manganese, silicon, carbon and iron, and supplied in bare form for oxyacetylene application and in coated form for arc welding. It is available in 5 sizes of rod from ⅛ to ⅜-inch and in 14-inch lengths. Deposits of the alloy are said to average 54 to 58 rockwell C scale, and form dense deposits free from porosity and shrinkage cracks. Type self-hardening K is composed of molybdenum, manganese, silicon, carbon, vanadium and iron, and is made in the form of tubes with the mixed alloys on the inside. It is available in bare and coated forms, and in three rod sizes from ⅛ to ¼-inch. Arc welding rods are 14 inches long and gas welding rods are 28-inches long. Deposits of the alloy are said to average 50 to 54 rockwell C scale.

Collet Chuck

Stow Mfg. Co., Inc., Binghamton, N. Y., has made available a new single, compact single purpose collet chuck which can be attached



quickly to hand pieces used on the company's flexible shaft machines. The new unit is available in two sizes, with ¼-inch and ⅜-inch chucking capacity. With the straight thread, hexagon head stud, the collet chuck interchanges with the clamp spindle on the standard head piece. With the tapered shank it fits into the tapered socket of the high speed hand piece, used with rotary files, mounted points or other high speed tools, to assure true running on precision work. The tapered type collet chuck also will fit a tool post attachment for grinding operations on a lathe.

Grinding Wheel

A. P. deSanno & Son, Inc., Phoenixville, Pa., is introducing a new type precision grinding wheel. Properly used it is claimed the new wheel takes deeper cuts, up to 0.010-inch or more and thus increases ordinary production to a marked extent. Structure of the wheel is stringy and porous instead of sandy and compact. Air cells allow the air to keep every grinding contact cool. Due to a new vitrified bond it is claimed the wheel is hard, tough, holds the corner and requires little dressing. Grinds hard alloys, copper, aluminum, wood, rubber, plastics and other soft materials with minimum loading.

Lead-Base Bearings

Two new lead-base bearing metals have been developed by the Magnolia Metal Co., Elizabeth, N. J., as substitutes for tin-base babbitts. One is designed for applications where bearings must withstand heavy sustained pressures such as on marine reciprocating engines, water turbines, paper mill calendar stacks, and rolling mill machinery. The other is said to with stand shocks without cracking and designed for use in internal combustion engines, rock crushers and sifter machinery.

Safety Clothing

Safety Clothing & Equipment Co., 7016 Euclid avenue, Cleveland, recently has placed on the market a new line of safety clothing including such items used by foundrymen

as leggings, aprons, pants and gloves. The material from which the clothing is made is coated with neoprene, one of the new synthetic rubbers and it is stated furnishes protection against heat, sparks, splash, acid, chemicals, oils, etc. Various items are available in light or heavy weight material.

Transformers

Jefferson Electric Co., Bellwood, Ill., has extended its indoor air cooled power circuit transformers to include capacities from 25 to 150 volt-amperes inclusive for operating 115 volt devices from 230, 460 or 575 volt power circuits. The transformers are designed to provide 115 volts for operation of light-

ing circuits, individual lighting for machine tools, welding machines and other production machinery and for 115 volt electrical devices, small motor driven equipment, magnets, controls, relays, etc. The transformer is claimed to make unnecessary the installation of complete, low voltage systems, save copper, conduit, installation time and reduces power costs. Transformers are self contained, equipped with roomy wiring compartment for primary and secondary connections, thoroughly insulated for safety and are listed as standard by Underwriter's Laboratories Inc. Transformers with 32 volt secondaries are available where lower voltage lamps are employed on machines.

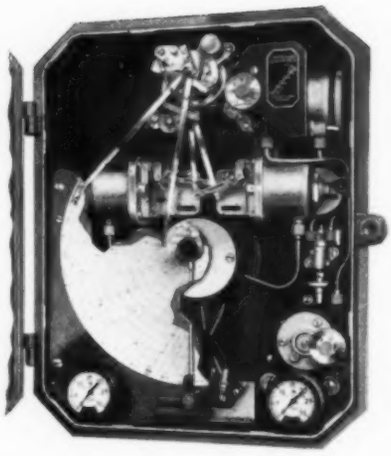
Rheostat Cages

Ohmite Mfg. Co., Chicago, has placed on the market a variety of rheostat cages in which the cage enclosure as shown in the accom-

panying illustration is a convenient form of table top or surface mounting and is advisable where there is possibility of mechanical injury to the rheostat or human contact with electrically live parts. The cages are widely used in connection with fractional horsepower motor controls. Ventilated cages with perforated sides are most generally applicable. Other types include dust proof cages, cages to house rheostats in tandem, explosion proof cages, ventilated cages with one half closed as a splash guard and a laboratory type semiclosed table top cage. Various types of terminals can be supplied.

Ratio Controller

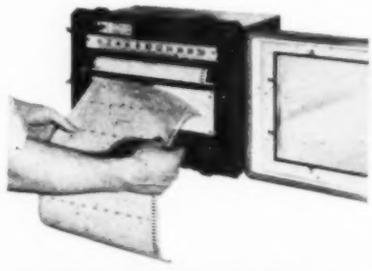
Taylor Instrument Companies, Rochester, N. Y., has made available an adaptable, convertible instrument for applications where a temperature, pressure, rate of flow, or liquid level must be controlled in a desired ratio or differential to another related variable. The ratio is changed by a screw driver adjustment directly on a calibrated dial throughout the range of 0:1 to 3:1, direct or inverse. With the new instrument it is unnecessary to disturb the processing or remove the chart plate while making ratio adjustments. An adjusting system indicates or records only. A controlling system may either indicate or re-



cord. Indicating and recording models are available with fixed high sensitivity, adjustable sensitivity, automatic reset, adjustable sensitivity with pre-act and adjustable sensivitity with automatic reset and pre-act.

Recorder Chart

C. J. Tagliabue Mfg. Co., Brooklyn, N. Y., now is supplying a new tear off feature for its recorders and recorder controllers. This daily or batch strip chart tear off feature consists of a tear off bar and a reroll with clip and tape. The special design clip without springs grips the chart firmly after a chart section has been removed. It is claimed that this feature is particularly useful for daily records and a complete record of any batch or run. The short chart strips readily may be filed for ready reference. Where daily records are required a special



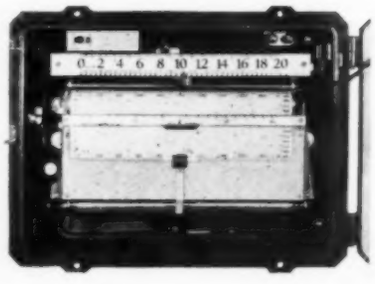


chart can be furnished with hour markings and with space to allow for resetting on correct time line.

WARD DOUGHERTY

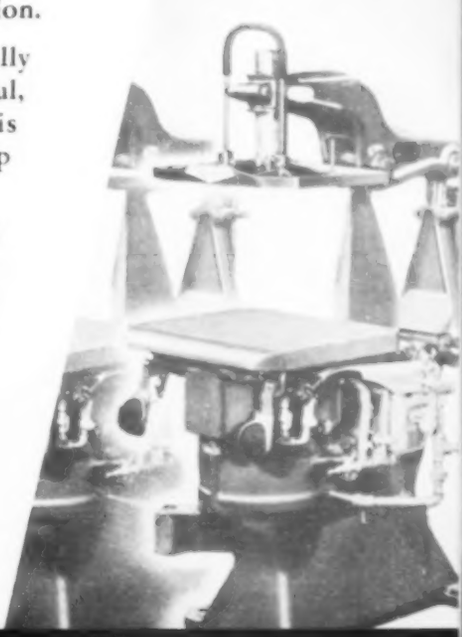
Record: A member of the Osborn organization for 25 years. Has had practical experience as a foundryman, sales and service training in the field, and intensive schooling in manufacture of the product. Spent 6 months in Russia helping to set up foundry operations at Autostrey. Now Osborn's Chief Inspector and Senior Service Engineer.

His job is to "Keep 'em rolling"—for you

Boiled right down, Ward Dougherty's prime responsibility as Chief Inspector and Senior Service Engineer is to make doubly sure Osborn Moulding Machines reflect their traditional excellence of manufacture and operation.

Having "grown up with the product" he is especially well qualified as Chief Inspector to see that the careful, thorough engineering that goes into Osborn design is accurately translated into the materials and workmanship of the finished machine.

As Senior Service Engineer his background of practical foundry experience and sales training make possible the fullest teamwork with the rest of the Osborn organization in assuring that Osborn machines maintain the high standards of performance for which they are built.



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OSBORN

MOULDING MACHINES

Watchword for Performance:

PRECISION

Illustrated here are some of the thorough checking operations typical of Osborn's methods of manufacturing high quality, high performance moulding machines.

Only by precise inspection procedure can we know that precision has been built into a machine. Only with precision machines can you, the foundrymen of America, be assured of speed, accuracy and consistently high quality in quantity production of moulds.

It is our job at Osborn to make every effort and take every care, from drawing board to assembly floor, to see that every one of those requirements is met.

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1. Before castings go to machine shop they are carefully checked against dimensional and quality specifications.

2. After machining, all major castings receive a 100% inspection before going to assembly floor.

3. Final check for accuracy and precision is made while machine is in operation.

OSBORN

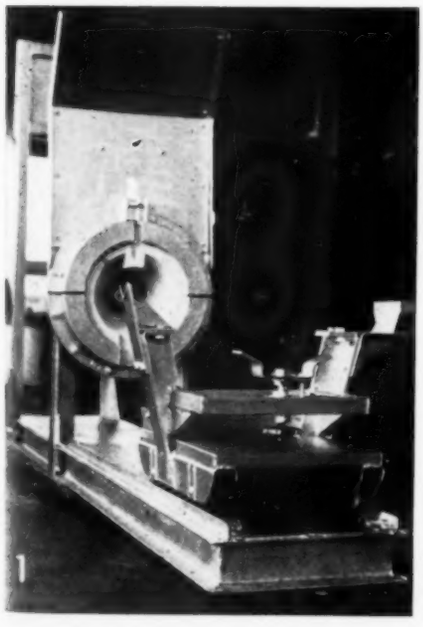
MOULDING MACHINES

Brinell Machine

Steel City Testing Laboratory, Detroit has placed on the market a brinell testing machine with a maximum opening for specimens 12½ inches. Throat distance from center line of elevating screw to inside wall of housing is 6 inches. Machines also can be supplied with greater or smaller distance to suit requirements. It is claimed this latest type machine is fully mechanical, accurately calibrated, easily operated and will last indefinitely with no upkeep and no change in calibration. Specimen table is lifted rapidly by a crank. Two adapters and the anvil shorten the time of adjustment. The machine is constructed with multiple beams functioning on hardened and finely ground knife edges and seats. After the specimen has been brought against the ball by the hand crank, the load is applied by stepping on an electric foot button at the base of the machine. Cycle of loading and unloading is automatically stopped at the end of the test. A dash pot under the weights prevents shock or vibration.

Ladle Preheater Uses Gas

Fast and uniform preheating of pouring ladles used in aluminum foundry practice has been accomplished at one eastern and two midwestern plants through a new gas-fired unit designed by the Selas Co., Philadelphia, around a special form of ceramic-cup radiant burner. Reductions have been reported in the number of castings rejected because of porosity and other defects attributed to localized ladle overheating. The unit, shown in Fig. 1, is typical of the five already placed in service since the development of the method a few months ago.

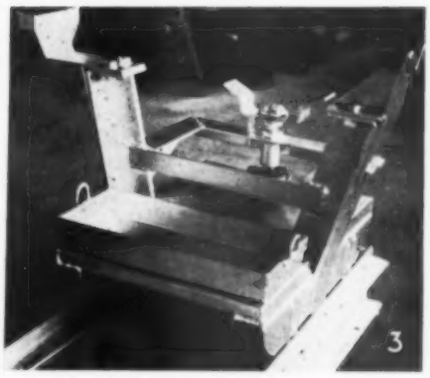


Essentially the apparatus consists of: (1) a traveling cradle which is fully adjustable to hold the ladle in a horizontal position, and (2) a radiant burner "bowl", or refractory combustion chamber, up to the face of which the ladle is run for the preheating operation. A closeup of the burner and combustion chamber is shown, during throttled operation, in Fig. 2. Fig. 3 shows the details of the traveling cradle.

The burner is a special modification of the K-570 gas radiant—the contour of the radiant-cup being extended by refractory shapes out

to an alloy ring 13 inches inside diameter. It is against this alloy ring that the rim of the ladle butts. Thus the radiant-combustion-bowl and ladle-lining together constitute a furnace enclosure, and the circumferential expansion of the products of combustion from the cup toward the ladle rim (along with the diverging beam of radiant heat from the incandescent cup concavity) are designed to give uniform, blast-free ladle heating without hot or cold spots. Combustion products are vented downward through the rectangular flue formed at B in Fig. 2 when the ladle is in position. This opening also serves as a slag drain. The burner consumes 287 cubic feet per hour of manufactured gas (or about 150 of natural gas) when operated with completely premixed gas and air at a burner pressure of 30 ounces. Between ladle heating cycles the burner is automatically throttled to a pilot consumption of 136 cubic feet per hour.

An iron-constantan thermocouple of the pencil-type protrudes through the sheet-metal heat shield behind the burner head, turns down through



a V-way and a U-clamp past the ladle rim (where an extra buttress of refractory protects it), and turns again to project parallel to the ladle wall (and within ¾-inch thereof) to near the bottom of the ladle, as shown at A in Fig. 2.

The traveling cradle is: (1) vertically adjustable for ladle size; (2) has a serrated block opposite the pivot-Y so that the longitudinal orientation of the ladle may be quickly and precisely manipulated to give a good flush fit of the ladle rim with the butt-ring at the burner opening; and (3) has an insulated top plate to protect wheel bearings. These features, as well as the slag catch pan, are visible in Fig. 3. The pivot blocks are interchangeable for left and right-hand ladles.

When the ladle is brought into position a limit switch opens the burner valve to full input as regulated by the demands of the thermocouple. At the same time the ladle automatically is locked into position, so that it cannot be removed too quickly by over-eager operators, and a timer is set in motion. At the completion of the time cycle the burner input is reduced to pilot consumption, the lock released, and a green light indicates that the ladle is ready for service. In one instance a red light shows during most of the heating cycle, but changes to amber when the ladle temperature is within a predetermined number of degrees of the desired temperature (usually around 1450 degrees Fahr.) A 300-pound ladle is used in all units to date. The principle could be applied, however, for other sizes.

Jig Clamps

Products Engineering Co., Los Angeles, has developed a new line of quick acting jig clamps claimed to be adaptable to practically all manufacturing, tooling and fabrication requirements. The line includes drill clamps, jig draw clamps, knife clamps, toggle clamps and jig cam clamps. Construction is a combination of hot rolled and cold rolled steel. Rivets and rollers are heat treated for strength and long wear.

TRANSPORTATION of raw materials from sources of supply to foundry yards probably will become a pressing problem by early fall. While railroads are doing an excellent job, it simply does not seem possible for them to meet all of the war demands on top of normal loads. Therefore foundrymen should make every effort to store bulk materials during the next 2 or 3 months.

The WPB has recognized the transportation problem, and has issued an amendment to Preference Order M-24, which removes inventory regulations on iron and steel scrap. With scrap flowing more freely during the summer months, it is urged by WPB that consumers purchase in excess of current needs and store for the winter.

The same need for shipment and storage during the summer exists in the case of foundry sand.

—□—

For some time the War Production Board has been moving toward complete allocation control based on end use. To accomplish this, a uniform classification system recently was announced with instructions that the designated symbols must be used on all orders placed by manufacturers, fabricators, primary producers, etc., after June 30, 1942, and on all succeeding orders which call for deliveries after July 31, regardless of when the orders are placed. Applications under the Production Requirements Plan for the fourth quarter must identify the end use of material for which application is made. WPB states the classification itself is comparatively simple, providing numbers from 1.00 to 23.00 being assigned to all major classes of military, industrial and civilian uses. These broad end use classifications are subdivided as necessary by the use of a number after the decimal point. For example, under the "Industrial and Civilian" heading, Class 8.00 covers "Raw Materials". Among other things this includes the manufacture of cast iron pipe and fittings; manufacture of metal castings; manufacture of gray iron and semisteel castings; manufacture of malleable iron castings; operation of nonferrous metal foundries.

Foundry equipment will fall in class 20.00 but as this is written, definite announcement has not been made as to whether 20.10—Metal Working Machinery, or 20.20—all other Industrial Machinery, will be in the final listing.

With all industry under PRP, and the end classification system in force, the paper work of foundries and equipment manufacturers becomes heavier.

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To permit manufacturers of foundry equipment to continue to receive materials on order on May 30, WPB recently issued Supplementary Order No. P-31-a. This order states that notwithstanding provisions of Preference Rating Order No. P-31, which expired on May 30, 1942, and the provisions of Priorities Regulation No. 1, any supplier to whom a preference rating has been applied, extended or assigned under that order may continue to apply the ratings of the order to complete deliveries rated under the order to the extent he could do so if order P-31 were still in effect.

—□—

A recent conversion seems to disprove the old proverb that one cannot have his cake and eat it. In this plant, engaged in the production of malleable castings, sufficient equipment has been added to provide duplex metal for pouring malleable, and triplex metal for steel castings. Iron melted in a cupola goes to the air furnace. A part of the metal from this furnace is poured into molds for production of malleable castings, and the remainder goes to the converter for production of steel. By changing the molding sand, this plant will produce both malleable and steel castings on the same conveyor line.

—□—

WPB, in announcing the new pipe line from Texas to Salem, Ill., states "Consumption of critical materials, however, will be minimized by the substitution of cast iron for steel in some places." Just for the benefit of the record, I would like to point out that this same substitution was proposed a year ago when the Texas-East Coast pipe line was under consideration. At that time engineers of several successful valve producers told the OPM that they would not recommend production of valves of the size needed in gray iron, or "semisteel", as the oil company engineers called it, unless they were stress relieved, and that, in their opinion, valves of the size required should be made of cast steel.

Substitution of gray iron for steel seems to be an expedient to get the line started, inasmuch as no capacity is available for producing the castings of steel without hindering the ship building program. Should these iron castings fail in service, who will get the black eye? I believe it will be the gray iron industry and not the engineer for the project who made the substitution against the advice of numerous experts.

—□—

Quite frequently the steady customers at foundry exhibitions, held under the direction of the American Foundrymen's Association in conjunction with annual conventions, raise the question as to which particular convention and exhibition was the largest. Therefore a recent statement by C. E. Hoyt, convention and exhibit manager of the A.F.A., should prove of considerable interest, since it shows that the 1942 war convention in Cleveland broke all records for registered attendance.

These statistics show the number registered at Cleveland in 1942 was 944 more than Chicago in 1940, 754 more than Cleveland in 1938, 1268 more than Milwaukee in 1937, 978 more than Detroit in 1936, and 98 more than the previous record attendance in Cleveland in 1930.

The A.F.A. and the Northeastern Ohio Chapter should take considerable pride in this record.

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Tungsten is recognized as important in so many uses that no effort need be made to enlarge upon them here. Technical advice will be given on request.

Boron has in the past been regarded as "tricky." Prolonged researches by the Molybdenum Corporation, aided by the metallurgical staff and facilities of a leading university, have been devoted to the incorporation of Boron in iron and steel, and have developed satisfactory methods on which a patent has been granted. Supplies of Boron are ample, sources of material entirely within the United States. Full information is offered to any American manufacturer.

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activities of foundry groups

Twin City

ANNUAL meeting of the Twin City Chapter of the A.F.A. was held May 25, at Kipp's Buckhorn Lodge, Long Lake, Minn. Eighty-six members and guests assembled at 7:15 for a delicious steak dinner. Between courses the president of the chapter, Max Aker, Western Alloyed Steel Castings Co., announced the new committees for the coming year which are as follows: *Program*—Chairman, R. W. Bingham, American Hoist & Derrick Co., St. Paul; S. L. Cameron Jr., Valley Iron Works, St. Paul; O. W. Potter, University of Minnesota, Minneapolis; *Membership* — Chairman, R. C. Wood, Minneapolis Electric Steel Castings Co., Minneapolis; A. Carlstrom, Smith Sharpe Co., Minneapolis; Sheldon Pufahl, Paul Pufahl & Son Foundry Co., Minneapolis; A. H. Trapp, Minneapolis-Moline Power Implement Co., Minneapolis; E. R. Frost, E. R. Frost Co., Minneapolis; R. A. Coolidge, Koppers Co., St. Paul; Fulton Holtby, University of Minnesota, Minneapolis; *Apprenticeship*—Chairman E. W. Eichorn, American Brake Shoe & Foundry Co., Minneapolis; Sidney Baumgardner, American Hoist & Derrick Co., St. Paul; J. F. Quest, J. F. Quest Foundry, Minneapolis; *Student Branch*—Chairman, H. F. Scobie, University of Minnesota, Minneapolis; Fred Frough, Diamond Iron Works, Minneapolis; Ralph Jones Jr., St. Paul Foundry Co., St. Paul; *Nonferrous*—Chairman, Fred Kaim, Union Brass & Metal Mfg. Co., St. Paul; J. S. Garske, Progress Pattern & Foundry Co., St. Paul; C. W. Olson Jr., C. W. Olson Mfg. Co., Minneapolis; *Gray Iron*—Chairman I. F. Cheney, Griffin Wheel Co., St. Paul; Herbert Larson, Minneapolis-Moline Power Implement Co., Minneapolis; W. W. Snyder, American Brake Shoe & Foundry Co., Minneapolis; *Steel*—Chairman, Charles C. Hess; Western Alloyed Steel Castings Co., Minneapolis; H. M. Patton, American Hoist & Derrick Co., St. Paul; H. H. Blosjo, Minneapolis Electric Steel Castings Co., Minneapolis; *Pattern*—Chairman, Joe Costello, American Hoist & Derrick Co., St. Paul; H. J. Flaaten, Midwestern Pattern Co., Minneapolis; A. H. Trapp, Minneapolis-Moline Power Implement Co., Minneapolis; *Auditing*—Chairman, E. D. Madson, Andersen Foundry Co., Bayport, Minn.; S. L. Cameron Sr., Valley Iron Works, St. Paul. Committee chairmen were allowed a few minutes to announce plans of their committees.

Immediately following the dinner, the meeting was turned over to H. F. Scobie, chairman of the committee on student papers. Prize winning papers and students were announced and each presented an abstract of his paper. Winners were: Leo J. T. Brom, "A Study of Minnesota Sandstones as Possible Foundry Materials" first prize $20; H. R. Dahlberg, "Pearlitic Malleable Cast Iron and Its Possibilities," second prize $10; S. S. Silberg, "A Torsion Impact Test for Cast Iron," third prize $5. Following the papers a brief discussion was allowed from the floor.

Remainder of the evening all present participated in a bowling tournament.—*O. W. Potter, secretary-treasurer.*

Birmingham

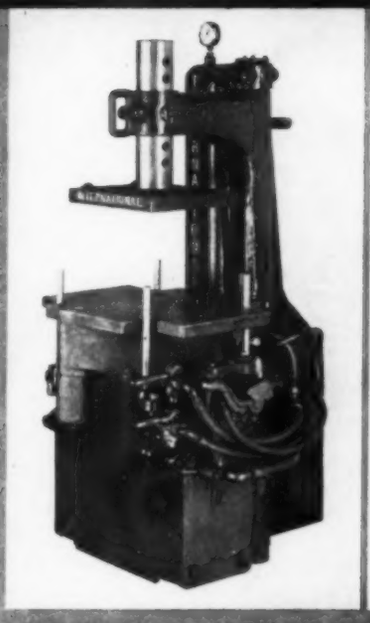
FINAL meeting of the current season of the Birmingham District Chapter of the A.F.A. was held May 15 with J. A. Bowers, American Cast Iron Pipe Co., and chairman of the chapter presiding. Howard Nelson, Hill & Griffith Co., presented a report of the annual A.F.A. convention which was held in Cleveland recently.

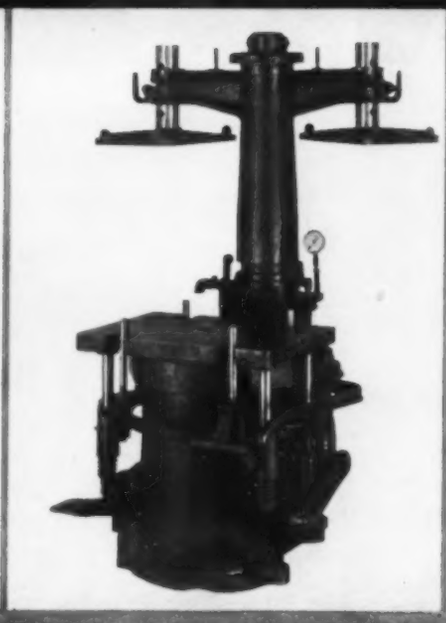
Since no additional nominations were submitted to the secretary, the chairman requested that a unanimous ballot be cast by the secretary for the following officers and directors: Chairman, E. A. Thomas, Thomas Foundries Inc., Birmingham; vice chairman, W. Carson Adams, Carson Adams Coal & Coke Co., Birmingham; secretary-treasurer, Howard Nelson, Hill & Griffith Co., Birmingham; directors to serve 3 years, A. S. Holberg, Alabama Clay Products Co., Birmingham, J. A. Bowers, American Cast Iron Pipe Co., Birmingham, J. M. Franklin, Central Foundry Co., Holt, Ala., Thomas Bellsnyder, Jefferson Foundry Co., Birmingham, and a director

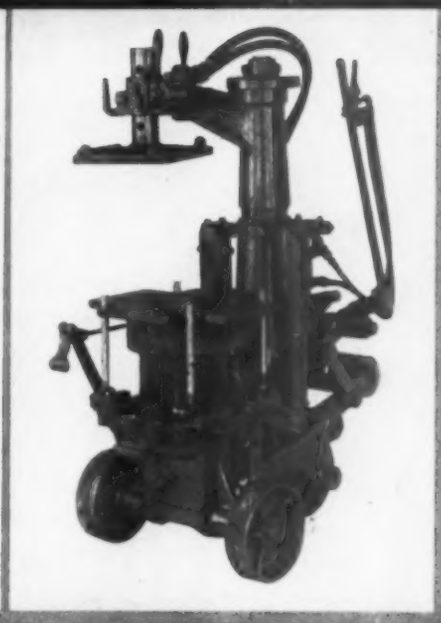
(*Continued on page* 123)

First annual student night of the Twin City Chapter of the A.F.A. featured the announcement of prize winners in a technical paper contest sponsored by the chapter. Photo on the left shows left to right R. W. Bingham, vice chairman of the Twin City Chapter, Max Aker, chairman of the chapter, Harry Dahlberg, second prize winner, Leo J. T. Brom, first prize winner, and Sidney S. Silberg, third prize winner. Photo on the right is a general view of the group who attended the meeting. Photos courtesy of Prof. Fulton Holtby, University of Minnesota, Minneapolis

INTERNATIONAL MOLDING MACHINES







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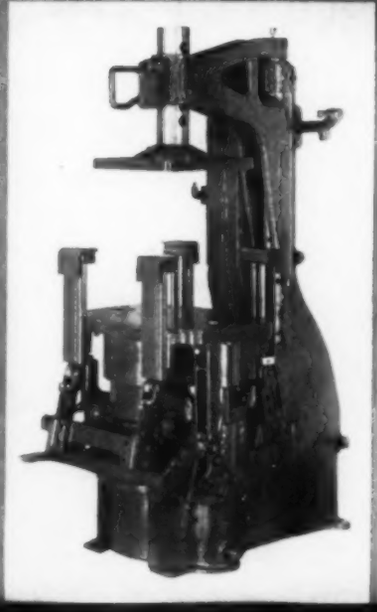

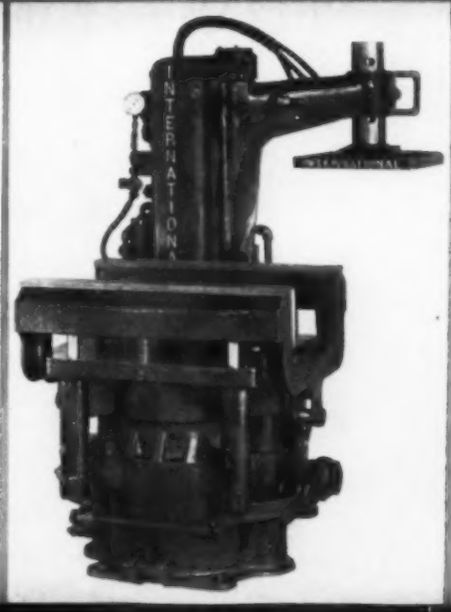

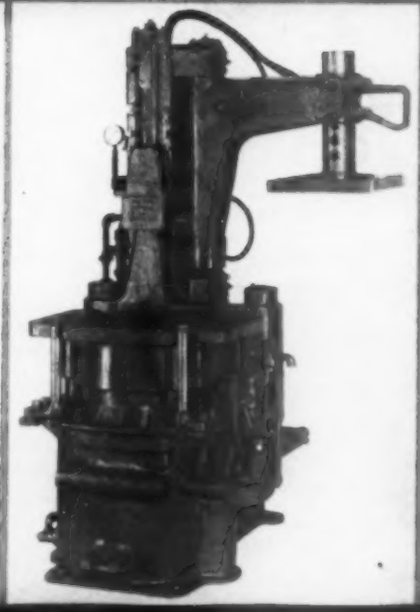

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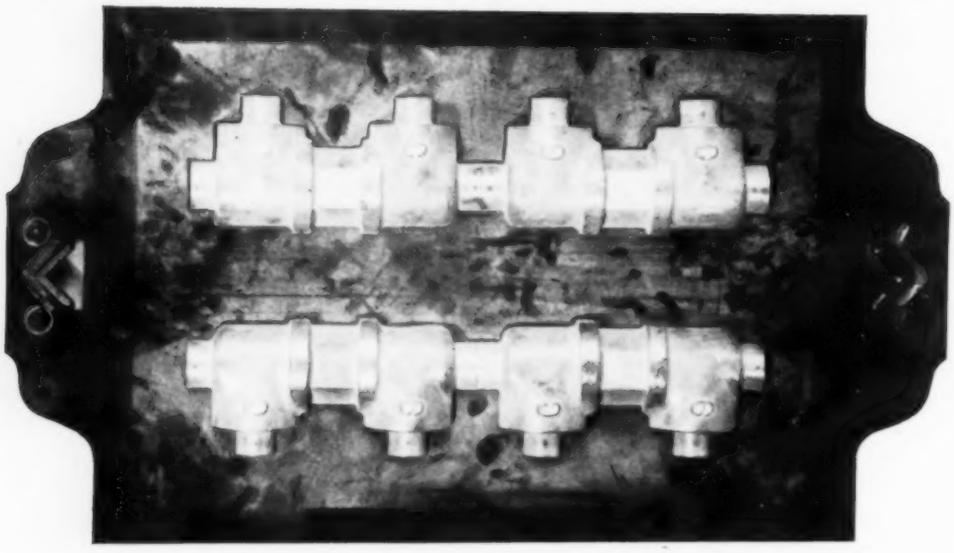

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(*Continued from page* 120)

to serve 1 year, B. W. Norton, Republic Steel Corp., Birmingham.

Mr. Holberg reported for the membership committee and stated that one additional member had been secured. T. H. Benners presented a report of the apprentice training committee and also presented prizes to Sam Carter, American Cast Iron Pipe Co.; J. L. Corley, Stockham Pipe Fittings Co., and Ray A. Dyke Jr., American Cast Iron Pipe Co. The prizes were $50 war bond first prize, and second and third prizes were $25 defense bonds.

Chairman Bowers then gave his yearly report. After the report, Mr. Adams made a motion that the chapter give a rising vote of thanks to the retiring chairman for the splendid job he has done.

The meeting was then turned over to George F. Vann who introduced the speaker of the evening, Fred W. Hanson, metallurgist, Electro Metallurgical Co., Birmingham. Mr. Hanson gave an excellent talk on "Recent Developments Alloying of Cast Iron, Economies of Cupola Operation." A general discussion followed in which many took part.—*H. G. Mouat, secretary-treasurer.*

Chicago

AN INFORMATION PLEASE type program proved most entertaining and enlightening at the May 11 meeting of the Chicago Chapter of the A.F.A. Because of the expertness of the experts, the chapter treasury suffered little.

James Thomson, chief plant engineer, Continental Roll & Steel Foundry Co., East Chicago, Ind., officiated and did an excellent job in keeping the quiz rolling. The board of experts included: A. W. Gregg, foundry engineer, Whiting Corp., Harvey, Ill.; J. C. Gore, Werner G. Smith Co., Chicago; W. B. George, metallurgist and foundry engineer, R. Lavin & Sons, Chicago; G. B. Stantial, foundry superintendent, Illinois Malleable Iron Co., Chicago; L. F. Lottier, assistant metallurgist, Peoples Gas, Light & Coke Co., Chicago; E. R. Young, metallurgical engineer, Climax Molybdenum Co., Chicago; G. A. Lilliequist, research division, American Steel Foundries, East Chicago, Ind.; Dee D. Cameron, foundry consultant, Chicago Heights, Ill.; and Herman Pfeifer, metallurgist, Electro Metallurgical Co., Chicago.

A secret committee made the choice of questions submitted in advance by mail by chapter members. Ten were accepted for use and earned $2 each for their proposers. Trick questions were barred. However, Mr. Thomson got away with one impromptu—namely, what happens when a body is immersed in water? Several technically correct answers were given by the experts, but these were ruled out in favor of the correct answer—the telephone rings!

By the rules of the quiz, if the experts failed to answer a question, the proposer would receive an additional $3. Only one question was missed and paid a dividend. This was: Why has a basic converter process of steel making never become established in the United States? The answer involved the phosphorus content of available ores, whereupon ensured a lengthy free-for-all discussion on the effect of phosphorus in steel.

Immediately following dinner, Chapter Chairman L. L. Henkel, metallurgist, Interlake Iron Corp., Chicago, conducted the annual business meeting at which officers and committee chairmen presented reports. Treasurer Charles C. Kawin, president, Charles C. Kawin Co., Chicago, revealed that activities of the past year had provided a slight increase in assets.

New chapter officers, nominated at the April meeting, were elected and installed. A. G. Gierach, assistant plant manager, American Manganese Steel Division, American Brake Shoe & Foundry Co., Chicago Heights, Ill., is the new chairman. M. F. Becker, vice president, Whiting Corp., Harvey, Ill., become vice chairman. The nominee for secretary finding it impossible to serve, Bruce L. Simpson, vice president, National Engineering Co., Chicago, agreed to continue in that office until July 1, when a successor will be named. Charles C. Kawin was reelected treasurer. Directors for 3 years are: Arthur S. Klopf, vice president, Hansell-Elcock Co., Chicago; R. A. Lindgren, superintendent of blast furnace department, Wisconsin Steel Co., Chicago; E. R. Young, metallurgical engineer, Climax Molybdenum Co., Chicago; and L. L. Henkel, retiring chairman.

As a token of appreciation of his service to the chapter during his terms as chairman, Mr. Henkel was presented with the past chairman's statuette.—*Erle F. Ross.*

Chesapeake

REGULAR monthly meeting of the Chesapeake Chapter of the A.F.A. was held at the Engineers Club, Baltimore, Friday, May 1. Walter Levi, Lynchburg Foundry & Machine Co., Lynchburg, Va., and chairman of the nominating committee, reported the following nominations to the various offices of the chapter for the coming year: President, J. E. Crown, Naval Gun Factory, Washington; vice president, R. T. Covington, American Hammered Piston Ring Division, Koppers Co., Baltimore, Md.; secretary-treasurer, L. H. Denton, Baltimore Association of Commerce, Baltimore; directors, Edwin W. Horlebein, Earl Bush and John Greenstreet.

W. G. Reichert, American Brake Shoe & Foundry Co., who was to have been the principal speaker, was unable to be present to give his talk on sand. Substituting for Mr. Reichert, E. W. Horlebein, president of the chapter, conducted a round table discussion on sand by inviting members present to give their experiences and opinions from the speaker's stand. The idea worked out exceptionally well, and some of the interesting points discussed were as follows: Consumers of sand should decide the grade of sand best suited for their needs and order by grain size, grain distribution, clay content, permeability and strength at a definite moisture content. Such nomenclature as Ethiopia foundry grade or Excelsior foundry grade should be discouraged. Specifications should be within commercial tolerances and checked by standard methods. Mois-

Prize winners in Birmingham Chapter's apprentice contest, from left to right: Sam Carter, American Cast Iron Pipe Co., first; J. L. Corley, Stockham Pipe Fittings Co., second, and Ray A. Dyke Jr., American Cast Iron Pipe Co., third

ture control is of extreme importance in synthetic sands. Sands running 100 grain size should have permeability of 75 to 90, moisture 3.8 to 4.2 per cent. Amount of bond also has a bearing on optimum moisture content. Synthetic sand requires different technique from natural bonded sand. Considerable difficulty is caused in foundries by not adding sufficient new sand to the heaps. Some foundries expect to get increased strength with higher moisture content, particularly those foundries who do not have sand control equipment.

Following the discussion a sound movie entitled "Sand" was shown through the courtesy of Whitehead Bros. Co., New York, and its local representative, Bert Read.

Final meeting of the current season for the Chesapeake Chapter was held May 22, at the Engineers Club, Baltimore. After dinner, a short business meeting was held for the election of officers for the coming year. Those nominated by the nominating committee headed by W. W. Levi, Lynchburg Foundry Co., Lynchburg, Va., were elected: President, J. E. Crown, Naval Gun Factory, Washington; vice president, R. T. Covington, American Hammered Piston Ring Co., Baltimore; secretary-treasurer L. H. Denton, Baltimore Association of Commerce. The following directors were elected to serve a 3-year term: Earl T. Bush, Naval Gun Factory, Washington; John Greenstreet, Maryland Car Wheel Co., Baltimore; and Edwin W. Horlebein, Gibson & Kirk Co., Baltimore.

It would be impossible to pass up the opportunity of paying tribute to the past president, Ed Horlebein. Ed, as all know him, is the father of the chapter and it was through his efforts and diligence that the chapter was started and has continued to progress. He has executed the duties of his office in an able manner and has created the feeling of good fellowship and close co-operation of the officers and members. The nucleus which he has formed and the precedents he has established will stand out as an inspiration to the future officers and members as a solid foundation for the continued success of the Chesapeake Chapter.

The technical session immediately following election of officers, was conducted by John A. Heard, superintendent, pattern shop, Crown Cork & Seal Co., Baltimore. Mr. Heard introduced the two speakers who participated in a friendly discussion of the relationship of the pattern industry to the foundry industry. Most interesting points brought out by both speakers were their unanimous opinions that the most ideal procedure in the final production of a satisfactory and economical casting was the complete co-ordination of ideas between the design engineer, the patternmaker and the foundryman.

The meeting concluded with the showing of a technical sound picture entitled, "Unfinished Rainbows" through the courtesy of the Aluminum Corp. of America.—*Frederick Bruggman.*

Northern California

LABOR relations was the topic discussed at the May 8 meeting of the Northern California Chapter of the A.F.A. E. M. Welch, American Manganese Steel Division, Oakland, Calif., and chairman of the chapter presided. James L. Blackie reported on the A.F.A. convention.

Almon E. Roth, president, San Francisco Employers' Council, San Francisco was the speaker. Mr. Roth formerly was comptroller, Stanford University. In his present position he is well acquainted with all phases of that section of the country's industrial problems.

With deep regret, the chairman announced the death of a director of the chapter, Ben C. Page, superintendent, F. K. Simonds Co., Berkeley, Calif., on May 3.—*George L. Kennard, secretary-treasurer.*

Various contributors to the Chesapeake Chapter's round table discussion on sand held May 1 are shown in the following photos taken at that meeting: (Left to right) David Tamor, American Chain & Cable Co.; E. W. Horlebein, Gibson & Kirk Co., and president of the chapter; C. W. Thomson, New Jersey Silica Sand Co.; E. W. Horlebein, Carl Ackerman, Naval Gun Factory; and J. E. Crown, Naval Gun Factory, who was nominated to serve as president of the chapter for the coming year. Photos courtesy of Frederick Bruggman, Gibson & Kirk Co., Baltimore

New England

MAY meeting of the New England Foundrymen's Association was held at the Engineers Club, Boston, May 13 with 90 members and guests present. Charles Schureman, F. E. Schundler & Co. Inc., Joliet, Ill., speaker, discussed, "Synthetic Sands for Armament". He outlined the following reasons why synthetic sands should be used in producing armament castings: Requires less new material and fewer cars, thereby relieving transportation; materials are readily available; results in good, clean castings; durability of the molding material is excellent; grain size readily controlled; good adaptability to physical testing.

The speaker gave a list of various types of castings now being made with synthetic sands, such as ingot molds, crankshafts, tank castings, types of heavy castings for ships, tanks, etc. The two most important things to remember in the process are—choice of base-sand, and selection of the proper bonding material. In the selection of the base sand, a material composed of subangular grains now is considered most satisfactory according to the speaker, as it requires less bonding material, less mixing time, and flows better than the strictly angular types. Less cutting of the mold also is noticeable. Many casting defects caused by expansion of sand grains are lessened because the round or subangular type sands have about 12½ per cent less expansion.

Although many foundrymen prefer that 75 per cent of the grains be retained on three adjacent screens in the screen test, Mr. Schureman found that in some cases this requirement was not thought necessary for a good molding sand. A good finish on a casting surface does depend on grain size.

In the selection of a binder, three kinds of clays are used: Kaolinite; montmorillonites and southern bentonites. The bentonites predominate in most steel foundries. The simplest synthetic molding sand consists of sand, bentonite and water. It is essential to keep the water content low. This mixture can be used in casting molten steel.

The speaker emphasized the importance of the dilatometer test and said that it is almost an essential instrument in steel casting work.

(*Continued on page* 126)

THREE NEW FLUX FORMULAS GIVE YOU CORRECT FLUXING ACTION THAT RESULTS IN SOUND WELDS...DENSE WELDS...and FAST WELDS EVERY TIME!

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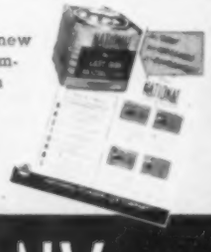

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(*Continued from page* 124)

Another important test mentioned was the flowability test stating that in the manufacture of cores it is desirable to keep the green sand strength at not over 3½ pounds, which would also give better flowability. Cereal binder acts as a means of minimizing the expansion of the sand. It is absolutely necessary that cores be thoroughly dried. More trouble is experienced from improperly dried cores than from any other cause. Water in undried cores reacts with carbon during the pouring of the mold, and the reaction is exothermic. This excess of heat causes an increase in sand temperature over and above that given up by the metal with the result that fusion takes place in the core when the temperature obtained from the metal does not apparently seem high enough to cause this fusion.

Before concluding, the subject of wood flour was discussed as an effective agent for use in sand to eliminate cracking of castings.

Raymond Meader, Whitin Machine Co., Whitinsville, Mass., and president of the association, presided at the meeting.—*Merton A. Hosmer.*

Ontario

FINAL meeting of the Ontario Chapter of the A. F. A. for the season was held at the Royal Connaught Hotel, Hamilton, Ont., May 1. N. B. Clarke, Steel Co. of Canada Ltd., chairman, presided, and a good crowd was in attendance to hear Don J. Reese, International Nickel Co., New York, discuss "The Cupola and Contemporary Problems on Materials." Mr. Reese was introduced by Hugh Watson, Alloy Metal Sales Ltd. Mr. Reese pointed out that the cupola, while normally associated with cast iron melting, has many applications in duplex and triplex processes, and is also used in some instances in the melting of bronze for large castings. However, he confined his discussion largely to cast iron.

With regard to the materials for cupola operations, it must be remembered that alloying elements are available in much smaller quantities than the total requirements of the United Nations. The use of alloys in the production of cast iron has been declining at a very rapid rate in the United States and will approach the zero mark within a few months, although there will still be small amounts needed for special applications. Alloys in cast iron must now serve a very clearly defined functional purpose and the application of the alloy castings must be in an important strategic position.

Regarding the control of chemical analysis in the cupola, it should be possible with good operations to keep the carbon within ten points above or ten points below the desired figure, and it is possible to control carbon to plus or minus five points. The minimum possible carbon that can be expected in operations with every latitude in selection of raw materials and operating skill of the highest order is 2 per cent.

Proportion and size of the materials going into the cupola are important and charges should be based upon weights of fuel and metal. These should be worked out on a sound basis and not adopted simply because they are easy to calculate in round figures. It is desirable to keep the maximum linear length of materials in the metal charge down to 30 per cent of the cupola diameter. Coke particles should weigh from 1½ pounds for a 72-inch diameter cupola down to as little as ¼-pound. It is very important to weigh the coke to get sufficiently accurate fuel charges and much of the chemistry of the process in the cupola depends upon the skill of the charging gang and the suitability of the equipment with which they are provided.

Fuel charge recommended for any size of cupola is 7½ pounds of coke per square foot of area. A 72-inch cupola has an area of 28.3 square feet, and with 7½ pounds of coke per square foot, the fuel charge would be 212 pounds. By proper proportioning of charges, much can be done to increase the thermal efficiency of the cupola.

In improving cupola practice it is well to proceed toward better fuel ratios in gradual increments. To get an understandable ratio between air flow and metal melting rates, both should be stated in terms of pounds per minute. This works out to about a 1 to 1 ratio. Melting rate in cupolas varies down to 10 pounds and up to 40 pounds per square foot. It is desirable to melt at or above 25 pounds per square foot.

At the special nonferrous meeting of the Ontario Chapter held April 10, it was suggested that a nonferrous committee be formed to cooperate with the office of the Metals Controller, Ottawa, in regard to conservation of tin and any other matters relating to the nonferrous foundry industry. At a meeting of the executive committee of the chapter at the Royal Connaught Hotel, Hamilton, May 1, the nonferrous committee was appointed as follows: Chairman, James Sully, Sully Brass Foundry Ltd., Toronto; secretary, J. C. Stavert, Babcock Wilcox, Goldie-McCulloch Ltd., Galt; A. H. Tallman, A. H. Tallman Bronze Co. Ltd., Hamilton; S. R. Francis, Metals and Alloys Ltd., Toronto; J. Wagman, Z. Wagman & Son, Toronto; E. J. Langan, Canada Metal Co. Ltd., Toronto; R. McIntyre, Mueller Ltd., Sarnia; H. V. Ivey, Empire Brass Mfg. Co. Ltd., London; H. W. Burgess, Wallaceburg Brass Ltd., Wallaceburg.—*G. L. White, secretary-treasurer.*

N. Illinois — S. Wisconsin

ELECTION of officers for the coming year was held at the May 12 meeting of the Northern Illinois-Southern Wisconsin Chapter of the A.F.A. at Hotel Hilton, Beloit, Wis. Approximately 55 were present.

The speaker, Mr. Howard of the Milwaukee office of the Federal Bureau of Investigation gave an interesting and informative talk on the work of the bureau—especially in combating espionage and sabotage efforts. A lively discussion followed during which he was bombarded with questions, many of which had to do with the fingerprinting and other identification measures being taken currently by defense plants.

Prize bell given the chapter for third place in the A.F.A. membership drive was presented.

It was decided that due to the press of the war effort, it would be inadvisable to hold a picnic this year.

New officers elected are: Chairman, Max Reutter, Fairbanks, Morse & Co., Beloit, Wis.; vice chairman, Roy Baysinger, George D. Roper Corp., Rockford, Ill.; technical secretary, J. H. McIntyre, Fairbanks, Morse & Co., Beloit; secretary and treasurer, R. W. Mattison, Mattison Machine Works, Rockford. The following were elected directors: G. K. Minert, Gunite Foundries Corp., Rockford; H. L. Klopf, Fairbanks, Morse & Co., Beloit, Emmet John, National Sewing Machine Co., Belvedere, Ill.; B. L. Baptist, Beloit Iron Works, Beloit.—*J. R. Cochran, technical secretary.*

Wisconsin

COMBINATION old timers and apprentice night featured the final meeting of the season of the Wisconsin Chapter of the A.F.A. held May 22 at the Schroeder Hotel. Approximately 275 foundrymen gathered to honor those who have helped make foundry history in the area as well as to welcome those who are to carry the banner in the years to come. Old timers presented with plaques as a token of the industry's appreciation for their efforts were: John Champion, general foundry superintendent, Nordberg Mfg. Co., Milwaukee; J. W. Mar

(*Continued on page* 128)

VOLCLAY BENTONITE
NEWS LETTER

REPORTING NEWS AND DEVELOPMENTS IN THE FOUNDRY USE OF BENTONITE

Interest in synthetically bonded molding sands is growing more pronounced.

The reasons are many.

Synthetically bonded sands are easy to control; they peel well, produce smooth casting surfaces which reduce cleaning costs.

Grain size and fines are easily controlled and there is little or no spent sand to haul away.

Physical properties are adjustable to all classes of work, using only a few base sands, eliminating storage of numerous natural sands to meet the varied needs of the foundry.

Materials used are readily available.

The base sand is used over-and-over, saving freight shipments....that may be important in case of car shortage.

★ ★ ★

Volclay Bentonite is a high-powered bond clay widely used in synthetic sands. It is many times stronger than fire clays or the clays contained in natural molding sands. A little Volclay makes sands stronger than a much larger addition of other clay substance.

It pays to use less clay in molding sand because:

(1) The sand is more open....less blows.

(2) Finer sand can be used....better finish, fewer cuts and washes.

(3) It can be rammed harder....castings closer to tolerance.

(4) Less dead clay accumulates....all clays lose their strength after repeated exposure to heat. Dead clay in sand is very detrimental, as it decreases permeability and requires more moisture to make the sand moldable. If you add less fresh clay, you accumulate less dead clay.

★ ★ ★

Have you read the Morey & Taylor A.F.A. paper "SOME PROPERTIES OF SYNTHETICALLY BONDED STEEL MOLDING SANDS"? It contains much interesting data for iron foundries as well as steel. We have condensed its thirty-six pages into a four-page leaflet with the meatiest facts boiled down for the busy foundryman. Ask the Volclay man for your copy.

VOLCLAY BENTONITE HAS SERVED FOUNDRIES FOR 15 YEARS!

AMERICAN COLLOID COMPANY

363 WEST SUPERIOR STREET • CHICAGO, ILLINOIS

(*Continued from page* 126)

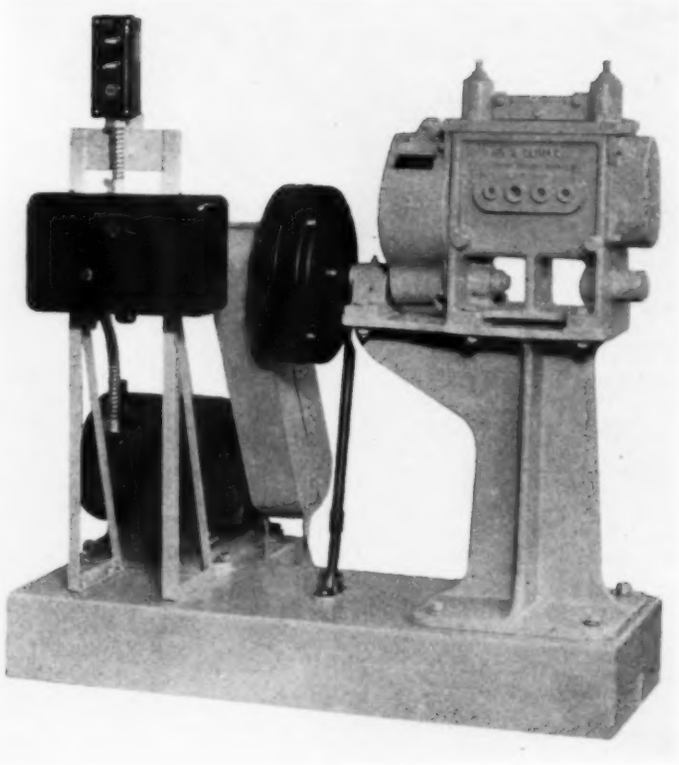
shall, Solvox Flux Co., Milwaukee; Martin Pusch, Pattern Department, Allis-Chalmers Mfg. Co., Milwaukee.

The chapter chairman stated that in awarding prizes to the apprentice winners, the chapter takes pride in the fact that of 12 possible national contest winners, six were representatives of the Wisconsin Chapter, and among them were two first place winners. The apprentices were presented the national award checks as well as those for the chapter's contest. Chairman of the apprentice committee, Dick Falk, received numerous congratulations as a result of the excellent showing which his committee made. Apprentices and their awards are as follows: Gray iron—second prize, Edward Drebus, Universal Foundry Co., Oshkosh, Wis., third prize, James Nowickas, Sheboygan Foundry Co., Sheboygan, Wis.; steel—third prize, Arthur Tazalla, Maynard Electric Steel Casting Co., Milwaukee; nonferrous—first prize, Ferd Sevenz, Ampco Metal Inc., Milwaukee, second prize, Dan Mrotek, Wisconsin Aluminum Foundry Co., Manitowoc, Wis.; patternmaking—

(*Continued on page* 131)

May 22 meeting of the Wisconsin Chapter constituted a combination old-timer and apprentice night as shown in the accompanying photographs, courtesy John Bing, A. P. Green Fire Brick Co., Milwaukee

HERE'S HOW TO SAVE MONEY!



RE-USE CORE WIRE

★ ★ ★

STRAIGHTEN THEM WITH A CLIMAX

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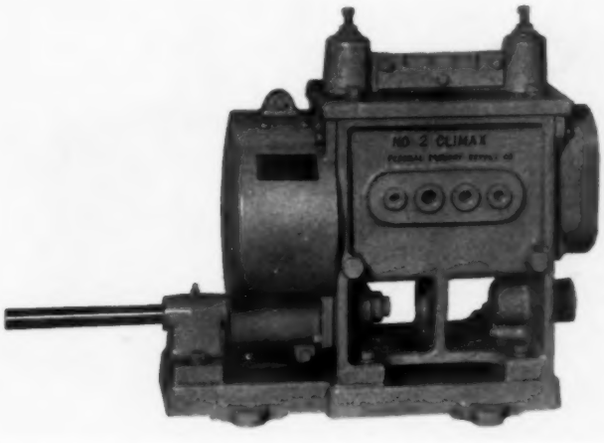
New Features:

LESS POWER REQUIRED!
MORE COMPACT DESIGN!
NEW REDUCTION DRIVE!
GREATER EFFICIENCY!
LOWER PRICE!

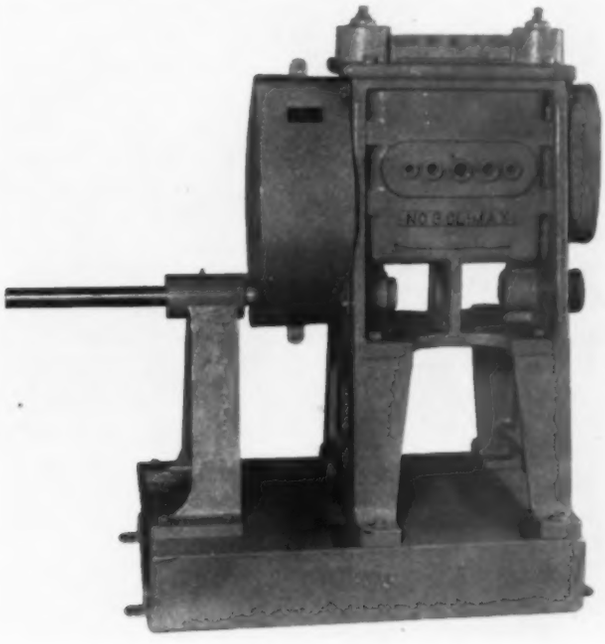
CLIMAX WIRE STRAIGHTENER — MODEL 2-A MOTORIZED
The model 2-A straightens 4 wires within the range of 1/16 to 1/4 inch. Model 2½ or 2½-A (not shown) straightens 4 wires from 3/16 to 1/2 inch dia.

CIRCULARS, PRICES AND COMPLETE INFORMATION FOR THE ASKING. GET THEM NOW.



MODEL 2 (*above*) Bench model. Same as 2-A shown at top but without pedestal and drive. Easily set up for flat belt or V-belt drive.

MODEL 3 (*at right*) Straightens rods from 1/4 to 3/4 inch. Can be had motorized similar to Model 2-A or as shown for your own drive.



THE FEDERAL FOUNDRY SUPPLY CO.

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CHICAGO—CHARLEROI, PA.—CHATTANOOGA, TENN.—DETROIT—MILWAUKEE—MINNEAPOLIS—NEW YORK—RICHMOND, VA.—ST. LOUIS—UPTON, WYO.

Do it Fast-Do it Right

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SPO MOLDING MACHINES

THE No. 216 SPO MOLDING MACHINE

The machine is important, of course. . . . The No. 216 SPO Molding Machine has a stripping mechanism which positively assures perfect draws and compensates for wear on the squeeze piston. Its few operating parts are shielded so that dirt is excluded from the pistons, even at the maximum squeeze stroke. The No. 216 is rigid, husky, built to keep maintenance costs away down. Its speed and endurance combine to make it essentially production equipment.

So—there are the features. How do they fit your picture? Will they *jump* your *output, bring down* your *cost* per casting, *improve* your *product?* You can trust SPO engineering to answer that question *right,*—engineering that stems from many years spent in your field as foundrymen.

The machine is important. The features are important. More important still is sound service that fits the equipment to the job. May we tackle your next problem with you?

SPO designs and builds both molding machines and pattern equipment and guarantees every installation to be in full accordance with your specifications.

Note the clean, simple design of the understructure.

SPO

INCORPORATED

Manufacturers and Specialists in Molding Machines, Vibrators and Patterns for Production

7500 GRAND DIVISION AVENUE • • CLEVELAND, OHIO

(*Continued from page* 128)
first prize, Casimir Skrocki, Falk Corp., Milwaukee.

The following recently elected officers were installed to serve for the coming year: President, George K. Dreher, Ampco Metal Inc.; Vice President, Howard Waldron, Nordberg Mfg. Co.; Treasurer, R. F. Jordan, Sterling Wheelbarrow Co.; Secretary, Harry Ladwig, Allis-Chalmers Mfg. Co. A. C. Ziebell, Universal Foundry Co., Oshkosh, Wis. was elected a director to serve 1 year.

In addition Emil B. Hansen, Wisconsin Appleton Co., and Robert C. Woodward, Bucyrus-Erie Co. were elected directors to serve 3 years.—*George K. Dreher, president.*

Pittsburgh

SAND problems were discussed at the final technical meeting of the year for the Pittsburgh Foundrymen's Association. Frank Kleeman, Westinghouse Electric & Mfg. Co., spoke on the comparative merits

One of the best attendances on record was chalked up at the annual outing of the Pittsburgh Foundrymen's Association held June 8. Photos courtesy R. L. Hartford, Pittsburgh

of synthetic sands and natural bonded sands under various foundry conditions, and a film on sand was presented by Whitehead Bros. Co., Buffalo.

Mr. Kleeman outlined advantages of natural and synthetic sands and also difficulties arising with each. In his opinion natural sands are desired because of minimum processing required, because of their insensitivity to small variations in moisture content, and the ease with which they can be patched. The speaker stated that synthetic sands must be mulled to get uniform distribution of clay; a 1 per cent variation in moisture content may mean a change in physical properties; they are difficult to patch, particularly after standing for some time, and the permeability may be varied over a wide range. However, synthetic sands may be made with higher strength as well as lower moisture content. Lower moisture also reduces the time element. Higher refractory qualities also are inherent as well as absence of lumps and impurities.

Mr. Kleeman stated that tests have shown synthetic sands have excellent durability and provide material economy. From 50 to 100 per cent more castings per volume of sand can be expected, and the sand is easy to control because each element can be added separately, thus permitting the variation of any factor without disturbing the others.

In practice, synthetic sands show up to best advantage in steel castings. They are also valuable for gray iron where castings are relatively small and turned out in fairly large numbers. According to the speaker, there has been little data gathered on the use of synthetic sands for large gray iron castings. Many nonferrous foundries have little use for close sand control, and as a result do not benefit greatly through the use of synthetic sands. Small shops, with a few molders and particularly those with highly skilled molders, have less use for a synthetic sand program than the larger shops where molders depend more on supervision.

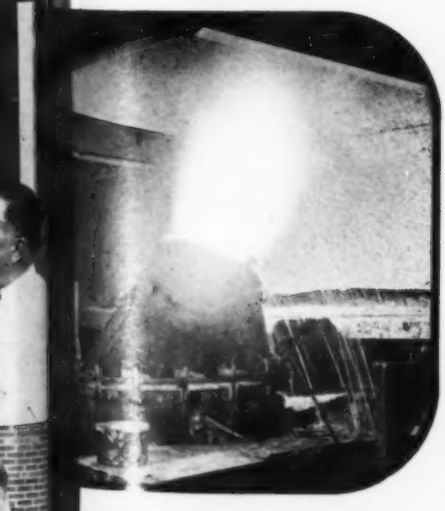
The speaker also gave a detailed discussion on the variations in synthetic sand and how to control them through the use of testing equipment. He included a detailed summary of the behavior and effects of different types of sand, fire clay, bentonite and other types of binders when added to the synthetic mix.—*R. L. Hartford.*

Golf and other outdoor sports occupied the attention of the large crowd attending the annual outing of the Pittsburgh Foundrymen's Association held June 8. Photos courtesy R. L. Hartford, Pittsburgh

INDEPENDENT RESEARCH *Confirms*

HIGH QUALITY OF CONVERTER STEEL

and adaptability for army ordnance castings



A research report . . . just released . . . shows the results of comprehensive tests recently made to determine the properties of steel produced by various processes. These tests, comparing converter steel with electric furnace and open hearth samples, show that converter steel has the qualities necessary to withstand strains, shocks, and fatigue at low temperatures. Thus, it is now demonstrated that converter steel can comply with the most exacting requirements—even at sub-zero temperatures.

Foundries already making steel castings by the electric furnace method, can get continuous production and tremendously increase their output by triplexing (cupola-converter-electric furnace). By using the Whiting Side-Blow Converter process, many gray iron foundries will be able to change over quickly to production of steel castings—with a comparatively small investment.

TURN PAGE FOR FURTHER INFORMATION

WHITING
CORPORATION
SIDE BLOW CONVERTERS

Here are Important Facts About CONVERTER STEEL from an Independent Research Report

"The melting medium is of little moment in determining the properties of cast steel . . . the only way to insure any desired property is to specify that property and test for it."

"The soda ash treatment has been developed to such a state of efficiency that sulphur specifications can readily be met with converter steel."

"Phosphorus can be brought within bounds by a ladle treatment with basic oxidizing slag."

"Mechanical or engineering properties of steels are governed by composition and by deoxidation practice, rather than by melting process."

LOW TEMPERATURE IMPACT PROPERTIES OF GRADE "B" STEELS

Single Width Charpy (Keyhole Notch) Impact Strength—Foot Pounds

Steel No.	212° F. Max.	212° F. Min.	70° F. Max.	70° F. Min.	32° F. Max.	32° F. Min.	0° F. Max.	0° F. Min.	—20° F. Max.	—20° F. Min.	—40° F. Max.	—40° F. Min.	—60° F. Max.	—60° F. Min.	—80° F. Max.	—80° F. Min.
Acid Open Hearth Steels																
493	30.5	30.0	27.5	23.0	22.5	21.5	21.0	20.0	19.5	13.5	17.0*	8.0	2.0	2.0	...	...
509	32.5	32.5	24.5	24.0	18.5	18.5	22.5*	8.5	20.0	4.0	17.0	2.0	2.0	2.0	...	...
F-1	22.0	21.5	19.5	16.5	13.5	12.5	14.5*	7.0	8.0	2.0	3.0	1.0	1.5	1.5	...	...
F-2	...	...	18.0	17.5	16.0	14.5	14.0	13.0	12.0	9.0	2.0*	1.5	1.0	1.0	...	...
Basic Open Hearth Steels																
9551	34.5	32.0	27.5	27.0	23.0	22.0	23.0	22.0	20.5	20.0	16.5	15.0	3.5*	3.0	...	...
9567	34.5	34.0	27.0	25.0	22.0	22.0	21.0	21.0	21.5	19.5	18.0	16.5	10.0*	2.0	...	...
0-1	...	...	24.5	20.5	18.0	12.0	16.0	16.0	17.0	12.5	5.0*	2.5	2.0	2.0	...	...
0-2	28.5	28.5	25.0	22.5	21.0	20.5	15.5	14.0	13.0	12.0	3.0*	2.5	...	...	...	...
Acid Electric Steels																
715	29.0	26.5	20.0	19.5	21.5	18.0	14.5	12.0	19.0*	2.0	2.0	2.0	...	...	...	...
724	27.0	26.0	24.0	22.0	19.0	16.0	18.5	18.0	15.0*	3.5	2.0	2.0	...	...	...	...
1009	25.0	24.5	21.5	18.0	14.0	13.0	15.0*	5.0	10.0	2.5	7.5	1.0	1.0	1.0	...	...
1025	27.0	26.0	22.5	20.5	15.5	13.5	19.0	17.5	16.0	14.0	6.5*	1.0	1.0	1.0	...	...
1163	23.0	19.5	23.5	21.0	20.0	19.0	17.5	16.5	15.5	15.0	12.5	11.5	13.5	10.5	9.5	9.0
Basic Electric Steels																
E-1	15.0	13.5	12.5	12.0	10.0	10.0	7.5	7.0	6.5	5.0	6.5	6.0	3.5	2.5	...	...
Converter—Acid Electric Steels (Triplex)†																
H-30	22.0	20.0	19.5	18.5	18.5	17.0	12.5	11.5	10.0	9.5	10.5	9.0	15.5	11.0	...	...
H-34	...	...	19.0	18.0	13.0	11.5	16.0	11.0	10.5	9.0	13.5	8.5	9.0	8.5	...	...
H-38	18.0	14.0	16.0	14.5	13.0	12.0	10.5	10.0	11.5	10.0	10.5	10.0	9.0*	5.0	6.5	5.5
H-42	...	...	14.0	12.5	10.0	9.0	9.5	7.0	12.5	12.0	14.0	6.5	5.0*	4.0	3.0	2.0
Converter Steels†																
1	24.0	21.0	22.5	20.0	20.0	18.0	14.5	14.0	17.0	16.0	14.5	12.5	15.5	15.0	12.0	12.0
2	32.0	30.0	27.5	27.0	25.0	24.0	23.0	23.0	21.0	20.5	19.5	17.5	18.0	16.0	14.5	14.5
3	30.0	30.0	26.0	25.5	25.0	23.0	24.0	20.5	20.0	18.5	18.5	13.5	18.0	17.5	17.0	14.5
4	30.0	29.5	26.0	25.0	22.0	18.5	21.5	21.0	19.5	17.5	16.0	11.0	17.0	15.5	15.5*	9.0
A	22.0	22.0	24.0	21.5	...	...	16.0	14.5	16.5*	9.5	11.0	5.0	10.0	8.5	5.5	3.5
B	...	...	13.5	12.0	10.0	10.0	9.5	9.0	7.5	7.0	5.0*	4.5	7.0	5.5	2.5	2.0
C	13.0	13.0	13.0	12.5	10.0	10.0	8.0	7.5	7.0*	4.5	3.5	2.5	4.5	2.0	2.0	1.5
D	...	...	23.5	23.5	18.0	15.0	16.0	11.5	12.5	11.5	11.5	11.5	13.0	9.5	7.5*	5.0

* Asterisk placed in data at temperature where low or erratic results were first encountered.

† Converter steels used in these tests were deoxidized by the addition of aluminum, which accounts for their very favorable showing at low temperatures. Subsequent tests have been made of open hearth and electric steels similarly deoxidized, but results of these tests had not been tabulated at press time. These will be included, however, in the report which we will send you.

Owing to space limitations the above data are necessarily incomplete . . . effects of composition and deoxidation practice naturally have an important bearing on any such series of tests. Hence, no conclusions should be drawn except after examination of the complete Report, which we will gladly send on request, to metallurgists and others interested in steel castings. Whiting Corporation, 15607 Lathrop Avenue, Harvey, Illinois.

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Southern California

LARGEST group of members and guests for the year as present at the May 18 meeting of the Southern California Chapter of the A.F.A. held at the Clark Hotel, Los Angeles. An unusually large number of guests representing nonferrous foundries were attracted by an up-to-the-minute program pertaining to WPB allocation. Chapter president, George Emmett, Los Angeles Steel Castings Co., Los Angeles, presided. Three members of the local War Production Board, Charles A. Taylor, Marcus B. Whitney and James J. McDonald, handled the subject of "Allocation and Priorities as Related to the Foundry Industry" and covered all phases of the foundry field, ending with an informal question and answer session.

Frank Britt, Manual Arts High School, spoke briefly regarding the solution of one phase of the labor problem. He proposed that employers suggest to a foundry applicant who cannot be hired because of inexperience, that he use his spare time learning the fundamentals of foundry practice in one of the free trade schools.

President Emmett announced the following officers and directors were elected to serve for the coming year, and would be installed at the June meeting; President, Earl Anderson, Enterprise Iron Works, Los Angeles; Vice president, Walter Haggman, Foundry Specialties Co., Huntington Park, Calif.; Secretary, E. M. Hagener, General Metals Corp., Los Angeles; Treasurer, W. D. Bailey Jr., Westlectric Castings Inc., Los Angeles. Directors to serve 1 year: B. George Emmett, Los Angeles Steel Castings Co., Los Angeles; Fred Edmison, Mechanical Foundries Inc., Los Angeles; Robert R. Haley, Advance Aluminum & Brass Co., Los Angeles; D. G. Luper, Grayson Heat Control Co. Ltd., Lynwood, Calif.; Earl Shomaker, Kay Brunner Steel Products Co. Ltd., Alhambra, Calif. Directors elected to serve 2 years: A. H. Popperwell, Reliable Iron Foundry Inc., Los Angeles; Donald Locke, Long Beach Iron Works, Long Beach, Calif; Charles R. McGraw, James E. McGraw & Son Brass Foundry, Brea, Calif.; and Dominic Meaglia, American Foundry Co., Montebella, Calif.

The technicolor picture, "Cupola Charging" then was shown through the courtesy of Modern Equipment Co., Port Washington, Wis.—*W. D. Bailey Jr., secretary.*

Northeastern Ohio

MORE than 200 members and guests attended the annual "Old Timers" night held by the Northeastern Ohio Chapter on May 14 at the Cleveland club. Ray Fleig, Smith Facing & Supply Co., acted as master of ceremonies and

More than 200 attended the annual "old timers night" held by the Northeastern Ohio Chapter on May 14 at the Cleveland club. Photos courtesy Sterling Farmer, Sand Products Corp., Cleveland

introduced a number of old timers to the group. They included Ben Fuller with 61 years service in the industry; Charles Marbeck with 60 years; Henry Oehling with 55 years; John Babbitt, James Quinn, and Fred Furnass with 54 years each, Pat Dwyer, THE FOUNDRY, 51 years, and John Burbol with 50 years service.

On behalf of the A.F.A., Mr. Fleig then presented certificates of award to the winners in the annual apprentice contest held by the association. Those receiving awards included: Walter Zernachal, Hill-Acme Co.; John Jasso, Wellman Bronze & Aluminum Co.; Robert Bina, Crucible Steel Castings Co.; and Richard Bareh, Crucible Steel Casting Co.

Following presentation of the awards announcement was made that since no further nominations had been made, the slate prepared by the nominating committee was unanimously elected. Officers include J. H. Tressler, Hickman Williams & Co., president; James G. Goldie, Cleveland Trade School, vice president; Jack Lathrop, THE FOUNDRY, secretary, and Russell F. Lincoln, Osborn Mfg. Co., treasurer. Directors for the 3-year term include: Frank J. Dost, retiring president; E. A. McDonald, Berted Foundry Co., Columbiana, O.; E. M. Follman, Griffin Wheel Co.; J. J. Witenhafer, Lake City Malleable Co.; T. G. Johnston, Republic Steel Co. Fred Pascoe, Westinghouse Electric & Mfg. Co., was elected to fill the unexpired term of Mr. Goldie.

Mr. Fleig then turned the meeting over to Mr. Tressler, the newly elected president, who spoke briefly. He stated that he would do his utmost to maintain the high standards set by his predecessors.

Detroit

FINAL meeting of the current season was held by the Detroit Chapter of the A.F.A. May 21 at the Rackham Memorial Building, with about 90 in attendance. Following dinner, the sound film, "Unfinished Rainbows," was shown through the courtesy of the Aluminum Co. of America. Speaker was George S. Evans, Mathieson Alkali Works Inc., New York, who discussed procedures and metallurgy involved in desulphurizing iron and steel in foundry operations. Mr. Evans presented a very interesting talk to the members of the group which evoked considerable discussion.

A number of distinguished guests were present at the meeting, among whom was Arthur T. Waterfall, recently returned from California, and an honorary and life member of the American Foundrymen's Association.

Nominations for officers for the chapter were presented and unanimously elected. They are: Chairman, Fred A. Melmoth, vice president, Detroit Steel Casting Co.; Vice Chairman, Omer L. Allen, Pontiac Motor Division, General Motors Corp., Pontiac, Mich.; Treasurer, W. W. Bowring, Frederic B. Stevens Inc., and Secretary, A. H. Allen, THE FOUNDRY.

New directors include: V. A. Crosby, Climax Molybdenum Co.; Harvey Miller, Walker Metal Products Co., Windsor, Ont.; C. E. Silver, Michigan Steel Castings Co.; F. A. Jensen, National Engineering Co.; Glenn Coley, Detroit Edison Co.; Carl F. Joseph, Saginaw Malleable Iron Division, General Motors Corp., Saginaw, Mich.; O. E. Sundstedt, General Foundry & Mfg. Co., Flint, Mich.; E. C. Hoenicke, Eaton Mfg. Co.; O. F. Carpenter, Packard Motor Car Co., O. E. Goudy, Kelsey-Hayes Wheel Co., E. L. Morrison, Budd Wheel Co., and Harry W. Dietert, Harry W. Dietert Co.

It was decided to suspend all social activities of the chapter during the summer and to concentrate on a super-outing to be held in September. A committee under the direction of W. B. Crawford, Atlas Foundry Co. already is at work making plans for the project.—*A. H. Allen, secretary.*

St. Louis

ANNUAL business meeting of the St. Louis District Chapter of the A.F.A. was held May 14 at the DeSoto Hotel. Secretary-treasurer submitted an annual report indicating that the chapter membership reached an all-time high of 164. A sound financial condition was noted, and all in all, chapter activities made considerable progress during the past year.

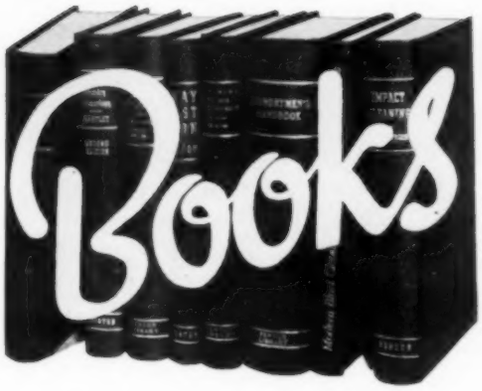
Plans for the chapter's forthcoming annual picnic were presented by Harold Wiese, entertainment committee chairman.

The chapter was pleased to have among those present C. E. Westover, executive vice president, and Robert E. Kennedy, secretary of the A.F.A. Both were greeted by the membership and each gave a few remarks indicating interest of the national group in the chapter activities.

Roy Jacobsen submitted report of the nominating committee, and the new officers elected are as follows: President, C. B. Shanley, Semi-Steel Casting Co., St. Louis; vice president, Luther Kleber, General Steel Casting Corp., Granite City, Ill.; secretary-treasurer, John Williamson, M. A. Bell Co., St. Louis. Directors elected: Walter E. Illig, Banner Iron Works, St. Louis; Francis O'Hare, Central Brass & Aluminum Foundry Co., St. Louis; A. O. Nilles, Griffin Wheel Co., Kansas City, Kans.; Lloyd C. Farquhar, American Steel Foundries, Granite City, Ill. It was also recommended by the committee and accepted by the group that Fred Riggan, Key Co., East St. Louis, Ill., succeed William McKee as a director. Mr. McKee left St. Louis for Birmingham some time ago.

Following an introduction of other out-of-town visitors, the meeting divided into three groups for round table conferences—steel, gray iron and nonferrous. These conferences were well attended and actively participated in by those who were present—*J. W. Kelin, secretary-treasurer.*

Over 4000 war workers employed at the three plants of the Manning, Maxwell & Moore, Inc., recently signed a solemn pledge to Gen. Douglas MacArthur to "Make Much More". The illustration shows Rear Admiral W. C. Watts, USN, inspecting the pledge handed him by Union President DeFrancisco of the company



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450 pages, 59 chapters, $1 postpaid. This book is a collection of the early chapters of Pat Dwyer's rollicking foundrymen, told in an exceedingly readable style. As practical as it is readable, this book tells the foundryman many practical things, including: the making of gears, open sand plates, sheave wheels, large pots, blast furnace coolers, winding or hoist drums, patterns, stand pipe connections, long columns; coremaking, etc. Originally sold for $3, this book is filled from cover to cover with down-to-earth, practical suggestions. If there is a foundryman who does not already have this book he is missing one of the most readable and usable books ever written.

ELEMENTARY FOUNDRY TECHNOLOGY
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377 pages, 132 illustrations, 16 tables, $3 postpaid. Revised and with a completely new chapter on malleable cast iron, this long recognized standard book on foundry practice sponsored by the National Founders Association, Chicago, thoroughly covers all phases of foundry practice and procedure. Subjects include: Elements of Iron, Iron Manufacture, The Cupola and Its Operation, Elementary Problems in Steel Foundry Production, Brass Melting, Foundry Sands, Gates and Risers, Molding Machines, Core Machines, Long Life Molds, and Malleable Cast Iron Foundry Practice. This book is ideal for both apprentices and practicing foundrymen.

MODERN BLAST CLEANING AND VENTILATION

213 pages, 38 illustrations, $4 postpaid. This book, by C. A. Reams, engineer of Ford Motor Co., brings latest and most approved methods of casting cleaning to foundrymen in plain language. It is full of completely practical suggestions and proved methods and practices. Application of cleaning methods discussed will eliminate many objectionable cleaning room practices. Full information on abrasive selection and use is included. Practical foundrymen report this book worth many times its cost.

GRAY CAST IRON

383 pages, completely illustrated, $5 postpaid. John W. Bolton, recognized foundry authority has collected and compiled in readable form all recent information on this subject, so presented that it is extremely usable. Includes latest information on structural metallurgy; engineering and physical properties, melting processes; casting defects; effects of regular and alloying elements; superheating; heat treatment; machinability and wear; effect of temperature on mechanical properties; corrosion, and specifications. This book is a "must" in every progressive gray iron foundry.

FOUNDRYMEN'S HANDBOOK

310 pages, fully illustrated, $3 postpaid. This book, reduced from $6 because some specifications are now out of date, has long been a standard reference book among foundrymen. It is a complete compendium and handbook covering every branch of foundry work from estimating the price to cleaning finished castings. If you do not already own a copy of "Foundrymen's Handbook" your working tools are incomplete.

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480 pages, 256 illustrations, $7 postpaid. Wm. A. Rosenberger is a recognized impact-cleaning engineer who has gathered together all important information on the subject and presented it in readily understood form. Every foundryman knows that cleaning costs can eat up profits. This book shows both theoretical and practical ways to reduce cleaning costs to a minimum. It presents the "how and why" of high cleaning costs and shows exactly the methods to be used in their reduction. No foundryman responsible for either quality production or satisfactory earnings should be without this book.

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240 pages, 126 illustrations, $2 postpaid. This book formerly sold for $5. Covers practically every phase of cupola construction, operation and maintenance. A thoroughly practical book. Suitable for the novice studying the cupola as well as the practical foundryman who operates it. Tables, formulas and a complete cross-index listing more than one thousand items makes this a valuable reference and practical work book.

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Consider Nonferrous Foundry Problems

War has brought about many new problems to the foundry industry. Nonferrous foundrymen of the Twin City Chapter of the A.F.A. area have been holding meetings once a month since last December to discuss and study their particular problems.

The conferences have proved to be helpful in many ways. In the first place the nonferrous foundrymen have become better acquainted and have come to realize that they all are pretty good fellows trying to do their job the best way possible. Many helpful suggestions have been brought out as to how to change over to war business and also how to make contacts and get war contracts, resulting in greatly increased output for many of the foundries. Various government orders on priorities and materials were studied so that all had a better understanding of them. A representative of WPB was invited to one meeting and the entire evening was devoted to clearing up questions regarding priorities and the procedure necessary to get needed materials. Not only was this helpful to the foundrymen, but also beneficial to the WPB in gaining first hand information as to the various problems of the foundries. As a result, the WPB men in the district and the foundrymen have worked together in solving these problems to the benefit of war production.

First meeting was held early in December before the country was at war, and many of the foundries were then producing a relatively small amount of defense work. Since Dec. 7, there has been a quick changeover and the conferences have proved a great help. At the present time all foundries are 100 per cent on war work, and most of them are producing more tonnage than normally.

At the last meeting it was decided to continue the conferences. The opinion was expressed that similar meetings would be helpful for other districts and also a national organization for the nonferrous industry would be desirable. The organization would represent the industry as a whole when vital problems concerning it arise. If such an organization had been in existence it is felt that the price freezing ruling by the OPA could have been handled more equitably for everyone concerned and also the various rulings in regard to scarce materials such as tin, lead, copper, nickel, etc., could have been simplified and clarified, making them more easily workable for the foundries. The fact that there are so many small foundries makes it difficult to get co-operation. The operators of the small foundries are so busy with their little jobs that they fail to realize the importance of group action. The present national emergency emphasizes the value of group co-operation. There must be complete co-operation by every firm and individual to win the war. If we lose, our little business and individualistic ideas will not be of much use.—*O. W. Potter.*

To Study Acid Open Hearth Problems

On May 10 a group of acid open hearth operators in the Pittsburgh district met as a temporary executive committee and organized the Acid Open Hearth Research Association. The committee was comprised of Chairman H. G. Grim, Heppenstall Co.; Vice Chairman F. H. Allison, United Engineering & Foundry Co.; Secretary F. C. T. Daniels, Mackintosh-Hemphill Co.; Treasurer R. C. Heaslett, Continental Roll & Steel Foundry Co..; A. R. Altman, Heppenstall Co.; J. S. Baldwin, Standard Steel Works division, Baldwin Locomotive Works; Dr. G. R. Fitterer, University of Pittsburgh; J. L. Nichols, Railway Steel Springs division, American Locomotive Co., and W. H. White, Pittsburgh Rolls Co.

Tentative proposal of the association is to set up two research fellowships at the University of Pittsburgh under the direction of Dr. Fitterer and to employ two full time practical metallurgists. One of the objectives would be to collect, correlate and reduce to practical value the large volume of literature on the acid open hearth. The second concerns an investigation of fundamental operating principles leading to economy of operation and improvement of quality. If the investigation indicates the desirability, the work later may be pursued under the separate classification of large castings, small castings and forgings.

Jeffrey Mfg. Co., Columbus, O., recently was awarded the Navy "E" for production achievement. The illustration shows H. W. De Bruin, vice president in charge of manufacturing of that organization making the acceptance speech for the employes. Just previously he had been presented with the Navy "E" button by Com. G. H. Bowman, U. S. N. (Ret.), who stands directly behind Mr. De Bruin. Seated, from left to right, are Gov. John W. Bricker of Ohio, O. R. Ehret, oldest Jeffrey employe with 63 years of service and Maj. Gen. Daniel VanVoorhis, U. S. A. commanding officer of the Fifth Corps area

Canadians Discuss Tin Conservation

Important meeting on tin conservation was held at the Physics Building, University of Toronto, May 27, under the auspices of the Affiliated Engineering and Allied Societies in Ontario, a group composed of 13 organizations, including the Ontario Chapter of the A. F. A.

The speakers and their subjects were: K. H. J. Clarke, Office of the Metals Controller, Department of Munitions and Supply, Ottawa, "The Metal Situation"; G. E. Tait, assistant manager, Dominion Engineering Co. Ltd., Montreal, "Alternate Bronzes"; J. S. Fullerton, development engineer, Handy & Harman, Toronto, "Alternate Bronzes"; I. I. Sylvester, chief inspector, diesel equipment, Canadian National, Railways, Montreal, "Alternate Babbits." Mr. Clarke stressed the vital need for tin conservation and the three following speakers indicated how important savings could be realized in bronzes, solders and babbits. In each case it was apparent that alternate materials were available with properties equal or superior to those of the traditional alloys for most applications, although there are certain purposes for which it is still difficult to suggest adequate substitutes. The meeting made it evident that important savings in tin could be affected with-

out impairing the quality of products. The principal problems are in the selection of the proper alternate material for a given purpose and the adaptation of manufacturing practice to its successful use.—*G. L. White.*

Study Production Of Castings

More than 60 foundrymen attended the session on foundry production problems, held in connection with the war production conference at the Essex House, Newark, N. J., May 29. The conference was sponsored by 15 engineering societies of national scope and by one state organization, at the request of the War Production Board.

Opened by Fred G. Sefing, International Nickel Co., New York, serving as chairman, the foundry meeting was divided into four groups with discussion leaders as follows: Aluminum and Magnesium castings, Harry Lamker, foundry superintendent, Wright Aeronautical Corp., Paterson, N. J.; Brass and Bronze, E. Biasotti, foundry superintendent, Neptune Meter Co., Long Island City, N. Y.; Gray Iron, Horace Deane, assistant works manager, American Brake Shoe & Foundry Co., Mahwah, N. J.; and Steel Castings, Karl Wheeler, vice president and general manager, American Steel Castings Co., Newark, N. J.

Various topics came up at the aluminum and magnesium discussion, including yield of good castings for metal poured, porosity, pouring temperatures, etc. At the bronze and brass conference much interest centered on substitutes for tin, with particular reference to silicon bronzes. Meeting specifications with new alloys that have reduced quantities of tin came in for much discussion as did over-reduced bronzes.

At the steel foundry session reference was made to the fact that comparatively light machining allowance was provided on nonferrous castings. Therefore a rapid machining schedule could be maintained. Steel castings are in a different category on account of more and larger risers, high temperature effect on the sand, and higher tensile strength metal. Before setting up a machining schedule, the steel casting producer should be consulted to discover what extra features are to be expected. The machining schedule then can be set up accordingly. In a discussion on alloy substitution it was pointed out that with proper melting practice, plain carbon steel meets the majority of requirements satisfactorily. Discussion on gray iron was devoted almost entirely to melting practice in various types of furnaces.

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READER'S COMMENT

Readers are invited to comment upon articles and other editorial material appearing in THE FOUNDRY. *The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief.*

THE EDITORS

Into the Open

TO THE EDITORS:

Read with considerable interest your editorial in the June issue of THE FOUNDRY. Many thanks are due you for bringing these facts out into the open. Perhaps they will add in crystallizing the minds of both nonferrous foundrymen and the WPB.

Many nonferrous foundrymen seem to have a confused idea of their industry. Due to a multitude of small foundries, they feel that any co-operation among the units of the industry would not succeed. Many in turn still have a clear picture of what happened in the NRA days.

Sometime ago I received a letter from the OPA giving some interesting statistics. In connection with a financial questionnaire that organization prepared, replies were received from 440 foundries which represented two-thirds of the total volume of nonferrous castings sold in the United States in 1941, the total value was $166,000,000. According to the statistics supplied three foundries sold $73,500,000 or 44.5 per cent; 19 foundries having over $1,000,000 in yearly sales sold $117,000,000 or 71.2 per cent; 33 foundries having over $250,000 in yearly sales sold $143,000,000 or 87.5 per cent; and 182 foundries having over $100,000 in yearly sales sold $157,000,000 or 95.7 per cent.

From these data it can be estimated that approximately 200 foundries represent about 90 per cent of the total sales volume of the industry.

In Chicago an attempt has been made to start an organization of nonferrous foundries. Unfortunately some are opposed to it on the ground that a foundryman is not handling the affairs of the movement. Personally I feel inclined to go along with them to see what can be accomplished. Heaven knows it will take an aggressive leadership with such an organization and I feel there are not many active foundrymen who have either the time or the ability to withstand the criticism which such leadership would require.

EDWIN W. HORLEBEIN
President
Gibson & Kirk Co.
Baltimore

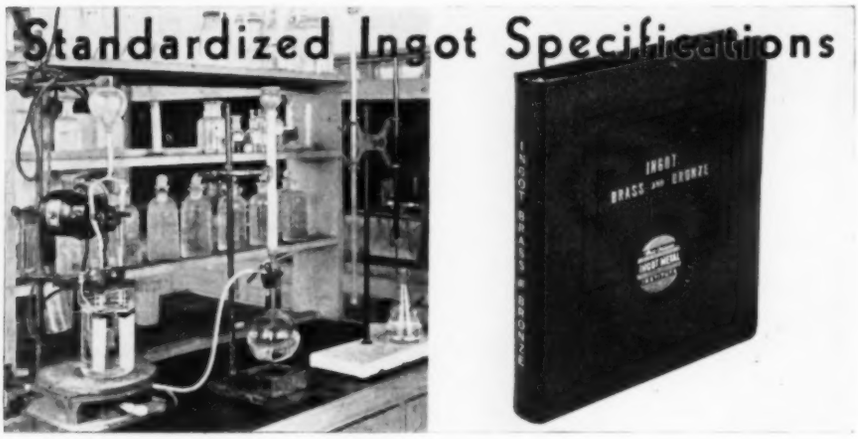
Unusual Accuracy

TO THE EDITORS:

The question on "Casting Must Maintain Close Dimensional Accuracy" in the question and answer column of the June issue of THE FOUNDRY requires unusual demands for minimum dimension and, therefore, low thermal expansion.

If the bosses, which obviously are set in from the end of each leg, are 2 inches from boss to boss, the metal would have to have an expansion coefficient of 2.17 millionths of an inch per degree Fahr. to expand just 0.001-inch when changing from —50 to +180 degrees Fahr. If the distance between bosses is less than two inches, the thermal expansion could be greater. For example, if they are 1-inch apart, the expansion of the metal may be 4.35 millionths per degree Fahr.

For such service I believe only the high nickel steels or cast irons have sufficiently low expansion to maintain the 0.001-inch total movement. The invar steel 35 per cent nickel could be machined out of the bar stock. The 35 per cent nickel cast iron, also having very low expansion, may be more easily made



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Ajax Phosphor Copper
Ajax Silicon Copper
Ajax Nickel Alloys
Ajax Phosphor Tin

NOTE

The first program for scientific control of ingot metal production was set up in and by the Ajax Metal Company 44 years ago.

A copper-silicon-zinc alloy of the useful and versatile 'Tombasil' family has been developed expressly for the war trend in nonferrous castings. Its use releases relatively large quantities of tin used in bronze alloys formerly required for such castings.

According to exhaustive laboratory and field reports, this new alloy, known as Ajax *Navy Tombasil*, possesses physical properties far in excess of either Govt. "G" Bronze (88-10-2 and 88-8-4), Spec. 46M6G; or "M" metal, Spec. 46B8G; as well as the Cu. Si. Alloy known as Spec. 46B28.

Your inquiries will receive prompt attention.

THE AJAX METAL COMPANY
ESTABLISHED 1880
PHILADELPHIA

ASSOCIATE COMPANIES:
AJAX ELECTRIC FURNACE CORPORATION, *Ajax-Wyatt Induction Furnaces for Melting*
AJAX ELECTROTHERMIC CORPORATION, *Ajax-Northrup Induction Furnaces for Melting, Heating*
AJAX ELECTRIC COMPANY, INC., *Electric Salt Bath Furnaces*

by casting to shape. Both of these materials have good corrosion resistance and probably would be satisfactory from that view point.

Also, I believe that melting metal borings in the cupola is done conveniently as described in the June issue of THE FOUNDRY. I have used and found more convenient and more economical cupola charging cans made especially for this purpose by the Wheeling Corrugating Co., Wheeling, W. Va. They come in 6 and 7-inch diameters, 24 inches long with 2 circle end plates. They come with the lengthwise edges bent over 25 in a package. The edges are hooked together and hammered down with a few hammer strokes. The bottom plate is inserted and the tabs bent over to hold it in place. After filling, the top circle is put into place and anchored by bending over the tabs.

Several foundry supply houses will take orders for these cans. Be sure the order includes twice the number of end plates as cans ordered.

FREDERICK G. SEFING

Development & Research Division
International Nickel Co.
New York

There It Was

TO THE EDITOR:

Several days ago I was looking for a little information and the party to whom I applied for this information advised me that if I would refer to THE FOUNDRY magazine of June, 1909 I would find what I was looking for. I visited your library and did look this up, and sure enough, there it was.

This is just one other thing that makes us a subscriber to THE FOUNDRY.

JOHN H. TRESSLER

Hickman, Williams & Co.
Cleveland

Price Control

Research Institute of America Inc., 292 Madison avenue, New York, has published a 149-page analysis on "Price Control", which is one of a series. The analysis covers such subjects as: General freeze order; how producers' prices are ceiled; retail price control; export price control; quality control; how freight charges are handled; trade practice control; accounting and records; how to get relief from hardship; how OPA polices; OPA directory; tests of the law and general regulations; digests of price schedules and regulations. The treatise should prove timely and valuable to all classes of men engaged in industry. Copies may be obtained from the institute for $2.00.

"I Do This Every Year!" Accident-conscious men of industry look anxiously to the hot months — months when men sweat most — when ever-lurking Heat-Fag takes its heavy toll. It is a fact that as the heat curve goes up, so does the accident rate. For, workers who sweat lose body salt. Unless it is replaced — fatigue sets in. Vitality is sapped — men become inalert . . . and that's when accidents happen . . . and when man-hours are lost. For, Heat-Fag and accidents ride together!

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SALT TABLETS

QUICK DISSOLVING
(less than 30 seconds)
This is how a Morton Salt Tablet looks when magnified. Examine one—see how soft and porous it is inside. When swallowed whole — with a drink of water, they dissolve in less than 30 seconds.

Wherever workers sweat, Salt Tablets are needed, for they represent the simple, easy way to replace salt that's lost through sweating and hot work.

Case of 9000 10-grain salt tablets, ... $2.60

Salt-Dextrose Tablets, case of 9000 . . . . . $3.15

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FREE Sample Tube
Write—on your firm letterhead — for a pocket size sample tube of Morton's Salt Tablets and for the new folder — "Heat-Fag and Accidents Ride Together."

EVERYONE WHO SWEATS NEEDS SALT

DOING A JOB FOR
All Out PRODUCTION!

✓ SAVING TIME ✓ SAVING WORK
✓ FREEING MAN-POWER ✓ SAVING SPACE

IN foundries, ammunition plants, steel and brass mills, aviation machine shops and in scores of other plants, Standard Conveyors are doing an important job—keeping high-speed production machines supplied—moving materials and parts "on schedule" from department to department—freeing manpower for effective work in the nation's "battle of production."

"CONVEYORIZE" TO MEET TODAY'S NEED FOR SPEED

The 76-page booklet, "Conveyors by Standard," will aid you to determine the best types of power and gravity conveyors to step up production in your plant—suggests how you can "conveyorize" to meet today's need for speed—keep production flowing—utilize every square foot of floor space effectively—save time, costs, and manpower in handling. Write for your copy of Bulletin F-7, "Conveyors by Standard."

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POWER AND GRAVITY
Standard CONVEYORS
FIRST FOR FASTER PRODUCTION

Among Detroit Foundries

(*Concluded from page* 94)

risers have been developed for aluminum cylinder head castings by Ford engineers. Here is shown, left to right, mold, rough casting and cleaned casting before machining. These cylinder heads for radial engines hitherto have universally been sand castings. Because of the complicated finning, the molding technique is quite complicated and tedious. Now engineers of Wright Aeronautical Corp. have perfected a new type of cylinder head which is machined from a solid forging, the latter formed from an extruded aluminum bar of special cross section. Special high-speed milling machines have been perfected for slotting or finning the casting. The forged head is claimed to permit a 12-15 per cent increase in engine power by virtue of its increased strength, but certainly would be more costly than the cast head because of the greater amount of machining necessary. Furthermore, whether enough forging equipment and machining equipment could be provided to permit mass production of this type of head on short order seems questionable. It will doubtless be some time before any complete change to forged heads can be effected.

Foundry Wins Award

(*Concluded from page* 96)

secretary Hamilton Chapter American Red Cross awarded certificates to 13 employes recognizing that they had completed the official Red Cross first aid training course. The men gave a 15 minute first aid demonstration. Ceremonies closed with the showing of three reels of sound motion pictures and serving of refreshments.

Light New Stack

Jackson Iron & Steel Co., Jackson, O., blew in its new blast furnace Monday evening, June 8. The new stack is completely modern including air conditioning and a new No. 6 hot blast stove. The furnace was lit by Miss Anna Davis, sister of D. D. Davis president of the company. She used the same torch that she used to light the original stack on Oct. 6, 1908.

The new stack will have an increased capacity of 25 per cent over the stack which was dismantled. Its reconstruction was made necessary at this time due to the excessive demand for silvery iron which has been brought about by the present war emergency.

Adventures of Bill

(*Concluded from page* 102)

to note from your letter of recent date the prospect of throwing a mere $50,000.00 into a hole in the ground did not cramp your style. I have investigated this Mr. Bingo, of Derrier, Mich., and find that he is a kind of town character. According to local and apparently well authenticated gossip he was bitten by a dog many years ago and ever since has gone around armed with a big club—' "

"Must have been a thoroughbred dog," I interruptetd. "Probably Ch. Boris of Novgorod, ferocious ranger of the Russian steppes and lineal descendant of the giant hound Eatemalive who came into the country with Genghis Kahn. I hope the bite was not trivial."

"Whistle off your dog," said Bill. "And listen. Le's see. Where was I? Oh, carried a 'big club'. He is an odd job man and does work for old ladies. He is about 50 and his hobby is clipping newspaper advertisements from men who need money for promoting various schemes. He then tries to act as agent. According to my informants, people occasionally have come to see him, but no person ever has taken advantage of his services."

Given Navy Pins

On June 4, employes of the Sterling Foundry Co., Wellington, O., were presented with Navy "E" pins by L. D. McDonald, vice president, Warner & Swasey Co., Cleveland, owners of the Sterling foundry.

In his presentation to the foundry workers during the change in shifts, Mr. McDonald stated, "Because our company has received the Navy 'E' award, we naturally are anxious that all of you who are supplying us with machine tool castings should share with us the honor of wearing the pin."

Lieut. R. H. Dombey, in charge of naval recruiting for Northern Ohio, urged the men to do their utmost in producing the sinews of war for our fighting forces. Frank Dost, superintendent of the foundry, was toastmaster.

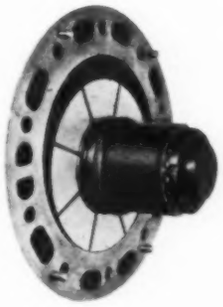
"Preventing Cutting and Welding Fires," the latest in a long list of pamphlets issued by the National Fire Protection Association, 60 Batterymarch street, Boston, directs attention to the fact that torch cutting and welding is America's No. 1 industrial fire hazard in 1942. Text is presented under the following heads: Ways a fire may start; preventing fires; preparation and precautions; and a list of rules for safe operating procedure.

RESULT: 9 ADDITIONAL FULLERS INSTALLED

Fuller Rotaries are built for capacities to 1800 C. F. M. actual free-air delivery, pressures to 125-lb.

Exceptionally low operating cost, resulting in all-around satisfactory performance of the initial installation, has resulted in the purchase of nine additional Fuller Rotary Compressors by a large eastern steel company. Following installation of this first unit, when compressed air demands increased, more Fullers were installed to best advantage.

This is not an exceptional case . . . many companies have found it pays to practically standardize on Fullers. If you haven't become acquainted with the possibilities of Fullers, *why not do it now?*



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C-56

FULLER
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Obituary

JOHN P. ARNOLDY, president and general manager, Warman Steel Casting Co., Los Angeles, died June 2 in Los Angeles. Mr. Arnoldy had been with the company since 1917, becoming secretary in 1923, general manager in 1925, and president in May, 1941.

* * *

Hobart S. Johnson, 68, chairman of the board of directors and former president, Gisholt Machine Co., Madison, Wis. died May 28 at his home following a long illness. Mr. Johnson resigned as president of the company in 1940, and was succeeded by his son, George H. Johnson.

* * *

Fred C. Burton, 68, formerly superintendent of the Capitol Brass Works, Detroit, died, May 13.

* * *

Charles George Roser, 55, secretary, Electro Metallurgical Co., New York, died June 8, in Muhlenberg hospital, Plainfield, N. J.

* * *

Harry J. Felsburg, 57, for the past 20 years, manager of the Philadelphia office, Sterling Wheelbarrow Co., Milwaukee, died in Philadelphia, May 12.

* * *

Henry Luedinghaus, 81, president, St. Louis Malleable Casting Co., St. Louis, and a former wagon manufacturer in that city, died May 18 in St. Louis.

* * *

George Brick Smith, 47, cost engineer in the production department, Newport News Shipbuilding & Drydock Co., Newport News, Va., died May 16 at Riverside hospital. Mr. Smith had been employed 26 years at the local plant. He received a degree in marine engineering and naval architecture from the University of Michigan, and a law degree from the College of William and Mary.

* * *

Maurice S. Greenberg, senior partner in the firm of M. Greenberg's Sons Brass Foundry & Machine Works, San Francisco, died in San Francisco, May 28. Mr. Greenberg's grandfather went to California in 1850 on a sailing ship around Cape Horn and established the first brass foundry in the West. Mr. Greenberg joined the firm established by his grandfather when he was 18 years of age, and has been successful in building one of the well known brass foundries and machine shops on the Pacific coast.

* * *

Benjamin C. Page, superintendent, F. K. Simonds Co., Berkeley, Calif., died May 3. Mr. Page was born in Stockton, Calif. where he attended public schools and a business college before becoming an apprentice at the Holt Mfg. Co., of which his uncle was owner. He was made superintendent of the Stockton plant in 1913, and in 1915 was sent East to study electric furnaces. When he returned to the Coast he was appointed superintendent of the Holt plant, Spokane, Wash., leaving there to become superintendent, Fairbanks, Morse & Co., Three Rivers, Mich., in 1918. Three years later he returned to California as superintendent, Best Steel Casting Co., San Leandro, joining the F. K. Simonds Co. in 1923. Mr. Page served as president of the Northern California Foundrymen's Institute and was a director of the Northern California Chapter of the A.F.A.

The 1942 *Plating and Finishing Handbook* has been published by the Metal Industry Publishing Co., 116 John street, New York. Included in the handbook are articles on surface treatments for magnesium; bright dipping and pickling of such metals as aluminum, copper, iron and steel; purification of plating solutions; and coloring of metals.

The Very Best Is None Too Good

★ ★ ★

OUR overseas forces whether on land, sea or in the air are entitled to and must have the very best tools to do the big job ahead.

Castings play a most important part so, to insure the best use only the best.

EJWOOD CORE OILS—A grade for every purpose—Always uniform and consistent.

LITEWATE PARTING—The Ace of Partings. Moisture proof—will not build up on Pattern Plates.

EUREKA CORE PASTE—In intricate aircraft motor assemblies EUREKA has been found to be the ideal paste medium. Strong—will not absorb moisture—will not swell.

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foundry activities

HOWARD FOUNDRY CO. with plants at 1700 North Kostner avenue, and on Bloomingdale road, Chicago, and its subsidiary, Aurora Bronze & Aluminum Co., Aurora, Ill., have been awarded the Navy "E" pennant for excellence in war production. News of the award reached the company May 24, its twenty-fifth anniversary. At the same time, the War Department approved a $1,500,000 expansion to the Bloomingdale road plant.

* * *

LaFonderie L'Islet Ltee., L'Islet, Que., has plans for plant addition to cost $25,000 with equipment.

* * *

Producto Machine Co., 990 Housatonic avenue, Bridgeport, Conn., has plans for a $40,000 plant.

* * *

Socal Foundry, 1985 East Sixteenth street, Los Angeles, is erecting another addition to its plant.

* * *

Stark Foundry Co., Canton, O., has remodeled its pattern shop at 1711 Dillon place South East.

* * *

Allyne-Ryan Foundry Co., Aetna road and East Ninety-first street, Cleveland, has planned interior and exterior alterations to its plant.

* * *

American Foundry & Pattern Co., Pontiac, Mich., has taken bids for construction of a $15,000 foundry building.

* * *

Pyott Foundry & Machine Co., 328 North Sangamon avenue, Chicago, is making a machine shop addition to its gray iron foundry.

* * *

Berg Metals Corp., 2652 Long Beach avenue East, Los Angeles, has been issued a building permit for construction of a new foundry building.

* * *

Johnson Foundry & Machine Works, Los Angeles, has been incorporated as the Johnson Foundry & Machine Co. with a capital of $75,000. Directors are: G. L. Chrisipe, Leonard Jacobsen and Evangeline Cadwell, all of Los Angeles.

* * *

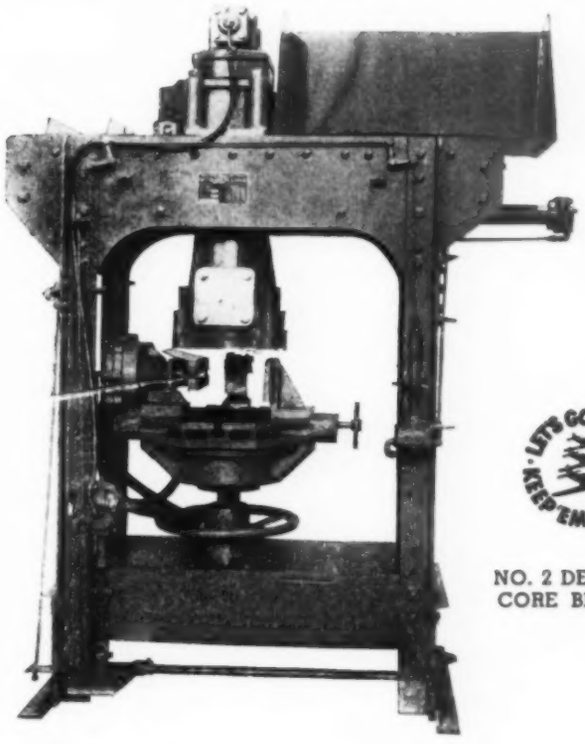
American Locomotive Co., New York, has been granted a renewal of the privilege to fly the Navy "E" pennant for achievements in the production of Naval ordnance. The flag has been flying over the company's Schenectady, New York plant since November 18, 1941.

* * *

National Aluminum Cylinder Head Co., Cleveland, has been organized by the National Bronze & Aluminum Co., Cleveland. The new organization will be housed in a new plant of more than 200,000 square feet area, to be financed by

★ ★ ★ 32nd YEAR ★ ★ ★

DEPENDABLE **CORE BLOWING** EQUIPMENT



NO. 2 DEMMLER CORE BLOWER

This standard machine is suitable for a wide range of core work in gray iron and malleable shops. Built into it are years of practical experience working with foundrymen . . . its high efficiency and simplicity of operation assure the SPEED and ACCURACY so necessary in today's drive for immediate production. It will give you long, satisfactory service with little attention. Investigate the possibilities of this and other standard and special machines made by WM. DEMMLER & BROS., KEWANEE, ILLINOIS.

DEMMLER

CORE BLOWERS *Exclusively*

the government, and will employ more than 1000 persons.

* * *

Los Angeles Steel Casting Co. is building an addition to its plant at 201 East Twenty-fifth street, Los Angeles.

* * *

West Michigan Steel Foundry Co., Muskegon, Mich., is building a foundry addition. Edwin S. Carman Inc., Cleveland, engineers.

* * *

Enterprise Foundry Co., Belleville, Ill., has been reorganized and a new board of directors has assumed charge of the plant and assets of the company. J. Edward Yoch, head of the board, said no plans have been made for immediate resumption.

* * *

Detroit Gray Iron Foundry Co., Detroit, has purchased 11 acres of property directly across from its foundry and plans to build a new foundry building.

* * *

Columbia Steel Co., West Coast subsidiary of United States Steel Corp., is building a $6,000,000 foundry on property adjoining its plant at Pittsburg, Calif. The foundry, which will add approximately 30,000 tons to the company's annual capacity for producing steel castings, will be equipped with two 25-ton basic open hearth furnaces and a 6-ton electric furnace.

* * *

National Bearing Metals Co., 4930 Manchester avenue, St. Louis, is constructing an addition to its foundry. Building was designed by E. E. Ballard, plant engineer.

* * *

Symington-Gould Corp., 20 Symington place, Rochester, N. Y., has planned a steel foundry to be located at Depew, N. Y. Estimated cost, $75,000.

* * *

Atwood Machine Co., Stonington, Conn., recently awarded a contract for a one-story addition to the New England General Contracting Co., New Haven, Conn.

* * *

Canadian Car & Foundry Co. Ltd., Amherst, N. S., has given general contract to Rhodes-Curry Ltd., 35 Lansdowne avenue, for an addition to its plant.

* * *

Cookware Co. of America, Hartford, Mich., has changed its name to Burnette Castings Co. The corporation, personnel and officers are the same.

* * *

Pacific Foundry Co., 3100 Nineteenth street, San Francisco, has awarded contract to A. T. Wilhelm for construction of a foundry to cost more than $40,000.

* * *

Hanford Foundry Co., 119 South Arrowhead avenue, San Bernardino, Calif., is making improvements to its foundry plant to the extent of $5000.

* * *

S. Parker Hardware Mfg. Co., 27 Ludlow street, New York, has leased a building at 208-216 Willoughby street, Brooklyn, and will equip it for making nonferrous castings.

* * *

Training in foundry work is being given approximately 30 NYA and WPA workers at a new foundry being operated jointly by the NYA and the Kaukauna Vocational school, Kaukauna, Wis. The building, 40 x 60 feet, is of brick construction. Equipment includes a cupola with a melting capacity of about 1½ tons an hour, electric core oven, sand conditioner, tumbling barrel, and a small brass furnace. The NYA and the vocational school have supplied about $14,000 for new equipment.

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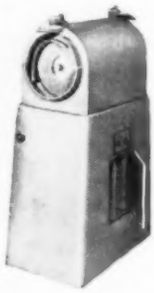

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For mounting small or irregular shape samples, for bakelite or transparent plastics. No margins, crevices and relief polish. Prevents differential etching action.

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MOLDS LARGE IRON CASTINGS

(*Continued from page* 75)

spaced equidistantly on the outside is lowered into place. The existing shoulder joint is covered with paper to form a parting. A coating of loam is applied to the plate and then the brick wall is built to the required height.

A new sweep attached to the spindle arm serves as a guide for the brick work, kept back a sufficient distance to leave room for a ¾-inch thickness of loam. When the brick work is finished the loam is daubed on by hand and cut to the required thickness by the sweep. Surface of this first application is open and rough. A smooth finish is imparted to the surface by applying a thin, liquid loam, strained through a sieve and known as slurry. This is thrown over the face from a small container and the sweep is revolved counter clockwise, or in the opposite direction from that employed in sweeping the first coat.

Loam from a natural deposit which does not require the addition of any artificial opening material, is highly permeable and therefore dries rapidly. After the surface is blacked, this outside part of the mold is lifted by the crane and placed on an oven car. The base or foundation is cleaned and treated in a similar manner.

May Use Two Spindles

Under certain conditions, the two parts of the mold might be swept around two separate spindles, located close together, or at any distance from each other. This latter method is adopted in many cases where time is an important factor and it is necessary to divide the work among two or more groups of men. In some cases the foundation plate is not lifted and placed in the oven. It is covered over and dried in position with gas jets, or with one or more coke fires in salamanders. This eliminates a certain amount of handling and crane service.

The mold is assembled by lowering the center core into place and if necessary making some slight adjustment to insure that it is truly perpendicular to the base. The six vane cores then are lowered and located accurately by the print at the bottom and by the print of the center core at the top. After the first core is in position, each of the following four cores is lowered at a sufficient distance to clear and then as it continues to descend is moved forward gradually until at the last half inch it comes into contact with the center core and with the preceding core. Insertion of the sixth or last core is a tricky and delicate performance involving nice skill and judgment.

With the cores assembled properly, the outside part of the mold is lowered into place. The shoulder joint at the bottom insures proper location. The mold is covered with either a sand cope or loamed plate. A heavy cast iron cross is placed on top and connected by slings or *S* hooks to lugs on the bottom plate. The crane is hooked to a loop in the center of the cross and the cross is pulled up tight. Iron blocks support the cross at a sufficient height above the top plate to provide space for the runner box. When the cross is pulled up tight, steel wedges are driven between the blocks and the cross. The crane then is released.

The runner box extends from the center to the outside of the mold for convenience in pouring metal from the ladle. Metal flows from the outer to the inner end of the runner basin and drops through a central sprue to the top of the center core where four gates set 90 degrees apart deliver it to the

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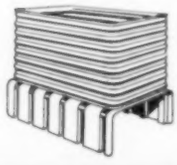
Truscon Foundry Flasks encourage production and profits because they require a very minimum of replacements and repairs. Truscon features of adequate flask wall thickness . . . proper placing of flanges . . . and correct types of handles and pin lugs, are an assurance of maximum returns from your flask investment. Write for illustrated catalog.



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permit the *efficient storage* of material, and *efficient* movement to production lines. Extremely durable and long-lived. May we study *your* material-handling problem?

Truscon Steel Company, Pressed Steel Division, 5100 Truscon Ave., Cleveland, Ohio. Subsidiary of Republic Steel Corporation.

TRUSCON FOUNDRY FLASKS

mold. Space between the mold and pit wall is filled with firmly rammed sand to prevent the brick wall from yielding when the mold is filled with molten iron.

Instead of feeding risers on the top flange, the flange space in the mold is extended upward for 6 inches. When the casting is machined, the extra metal is removed to leave a flange of normal thickness. This is more of a precautionary measure than an actual necessity. With carefully developed analysis and closely controlled melting practice, shrinkage appearing in this and other castings is almost negligible. A rigid mold also is a factor in the prevention of shrinkage. Skilled foundrymen are familiar with the fact that shrinkage sometimes is blamed on the iron, when in reality the direct cause is a mold yielding under pressure thus allowing metal to settle away from the top.

Three stages in the construction of a mold for the 38-ton casting shown in Figs. 6 and 9 are illustrated in Figs. 11, 12, and 13. The entire mold is formed in an assembly of dry sand cores in a pit surmounted by four long flask sides and ends bolted at the corners to provide a flat, level bearing for the cover plate, and a solid bulwark back of the cores forming the outside walls of the mold. Four steel rails, erected on the outside of each side, anchored in the bottom plate and later embraced by lugs on the top plate, prevent the flask parts from springing when the mold is filled with iron and exerting tremendous pressure in all directions.

A coke bed and a 6-inch layer of sand surmounted by a 2-inch layer of facing sand are rammed over the bottom of the pit, scraped off flat, blacked and skin dried with a torch to form a foundation for the cores. The mold with the outside cores and two of the inner cores in place is shown in Fig. 11. The same mold with nearly all the cores in place is shown in Fig. 12. These views also show the gating system adopted to deliver metal rapidly and simultaneously to the four sides from four ladles. Each of the four sides is formed by cores closely butted together to form a continuous wall.

Metal Enters at Bottom

On two sides each core section is pierced by two 2-inch diameter sprues, a total of eight sprues to a side. On the other two sides the two center sections are pierced for one sprue each, or a total of 20 sprues for the entire mold. Each sprue terminates at the bottom in a short, flat gate through which the metal enters the mold. Long basins on top of the cope, or large tapered pouring cups connected to runner channels in the under side of the covering cores conducted the metal to the vertical sprues in the side wall cores. A considerable amount of juggling and maneuvering is required to bring four cranes into pouring position over a comparatively restricted area.

Without any core prints on the bottom to serve as guides, the cores are located in the mold with squares and straightedge and with thickness pieces of wood supplied by the pattern shop. Usually the chief patternmaker or one of his assistants is present while the coring process is in progress. Although the cores are practically perfect in shape and dimensions, some slight adjustment occasionally is necessary in fitting a large number accurately in place.

Print cores pasted in the main cores support them on the bottom and also touch the cope to prevent the cores from rising when surrounded by the molten iron. Later the openings made by the print cores facilitate removal of the cores from the casting. A round print core on the side of each large core touches the adjoining core and maintains thickness of metal in the ribs which reinforce the in-

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Crawford Steel Foundry Co.
Hays Manufacturing Co.
Zenia Foundry & Machine Co.
Keystone Brass Works
Alloy Cast Steel Co.
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Hope Metal Products Co.
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Goodyear Aircraft Corp.
Taylor-Boggis Foundry Co.
Astatic Microphone Laboratories
Sanymetal Products
Safety Grinding Wheel & Machine Co.
Erie Resistor Corporation
Lighting Equipment and Mfg. Co.
Johnson Metal Products Co.
INCLUDED among Lanly purchasers are many nationally known organizations—companies whose high standards and exacting demands, of themselves, constitute endorsements of the products they purchase.
The excellent reputation earned by Lanly ovens in a comparatively short time is due largely to their highly efficient convection type air heaters and balanced, re-circulating air systems.
Lanly builds all conventional types of core ovens and special ovens that are guaranteed to handle unusual or uncommonly difficult jobs.
Write for Catalog containing a list of purchasers and an illustrated description of the entire line.
A. Schulman,
Twin Coach
Surety Rubb
Schill Mfg.
Miami Fou
Sun Rubb
Kelly Ma
Goodyear Tire & Rubber Co.
Cleveland Steel Barrel Co.
Ohmer Fare Register Co.
Reeves Steel and Mfg. Co.
Lake Erie Steel & Blanking Co.
Timken Roller Bearing Co.
Viceroy Manufacturing Co.
Acme Pattern and Tool Co.
Hall-Scott Motor Car Co.
Dayton Forging & Heat Treating Co.
Illustrated are two views of an oven with doors on both sides. Cores are inserted at the core room side and removed from the foundry side, providing fast and efficient "straight line production".
THE LANLY CO.
CORE OVENS
750 PROSPECT AVE.
CLEVELAND, O.

terior of the casting. As a precautionary measure, stud chaplets also are placed between the cores to insure rigidity of position.

After the outside or wall cores are set against the iron frame or curbing, the first row of interior cores is set with the side print cores in contact with the wall and with the other side print cores separating the cores to leave the proper rib thickness. The wood thickness strips referred to previously are placed upright to guide the cores into place. Chamber cores around the top between the two flanges rest on prints at the back and are supported in front on the top and bottom by chaplets. With all the cores in place, the small depressions around the loops employed in lifting the cores are filled with either green or dry facing sand. The green sand is slicked and brushed with plumbago. The dry sand is coated with wet blacking and dried with a torch.

To resist the upward thrust of the metal, or to put it another way, to compensate for the displacement of a casting approximately 15 feet square by 6 feet in depth from the top of the risers to the bottom of the cores, in this instance about 270 tons, the binding equipment shown in Fig. 13 is employed. Heavy steel loops with the lower ends anchored to the foundation plate, extend upward to the floor level. Short stirrups or slings embracing the ends of five cast iron binder bars are attached to the loops with *S* hooks. Three additional bars placed transversely on the first set are attached in a similar manner at the remaining sides or ends of the mold. A miscellaneous assortment of iron and steel blocks and wedges provide rigid contact at many points between the binder bars and the mold cover plate.

The casting is too wide to ship on a flat car. It is lowered on edge into a gondola and braced at the bottom with wood blocks bolted to the bottom of the car. Additional blocking is jammed between the casting and the two sides of the car. A stay bolt at each end extending from side to side of the car prevents the sides from spreading when the car sways or rocks during the journey. Wire cables anchored to the top flanges of the car sides, and extending over the top of the casting as shown in Figs. 6 and 9, maintain the casting securely in position.

Conserving Rubber

First Aid to Industry in Conserving Rubber, a 48-page illustrated book on conservation of rubber products, has been published by United States Rubber Co., Rockefeller Center, New York. Complete and explicit suggestions are given for proper care of rubber products from design through inventory and storage to use, maintenance, inspection and repair.

Nonferrous Advisory Committee Named

An advisory committee to represent the brass and bronze foundry industry on the War Production Board, has been appointed. Membership of that committee includes: B. J. Flaherty, Johnson Bronze Co., Newcastle, Pa.; Damon Wack, National Bearing Metals, New York; L. M. Nestlebush, Falcon Bronze Co., Youngstown, O.; N. H. Schwenk, Cramp Brass & Iron Foundries Division, Baldwin Locomotive Works, Philadelphia; J. P. Jefferis, Janney Cylinder Co., Philadelphia; W. C. Hardy, William A. Hardy & Sons Co., Fitchburg, Mass.; W. V. Storm, Western Brass Works, Los Angeles; W. C. Peare, E. A. Williams & Son, Jersey City, N. J. H. O. King, chief of the Copper Branch, is government presiding officer.

★

Speed War Production with

JIB CRANES

FASTER SAFER HANDLING AT LESS COST!

★ You will establish top efficiency—save man-hours—eliminate needless operations—reduce employee fatigue and promote real safety, when you spot and use these Jib Type Cranes at strategic points in your foundry.

No. 1044
Swinging Bracket—Hand or Electric. ½ to 3 Tons and up to 20 ft. radius.

No. 1046

No. 1046A

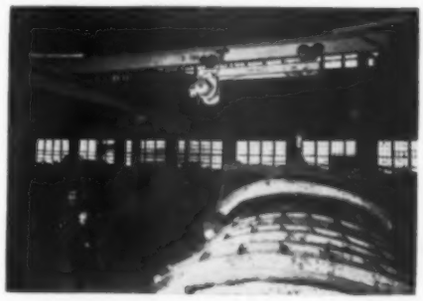
Let These "Mechanical Muscles" Increase Your Foundry Output

You can predetermine the time required for heating—casting—moulding—cooling—cleaning—inspection and other operations, but the "in-between" handling is the thing that can clip the cost sheet.

From induction of raw materials, through each foundry operation, to the loading of the finished product, you will find many places where these Pillar, Mast and Wall Type Jib Cranes can swing into action for greater foundry output.

WE URGE YOU—Ask us to send our latest circular showing the new and improved line of Chicago Tramrail Jib Mounted (Electric or hand-operated) Cranes. Make a quick survey of your present handling operations, and you'll be quick to locate production gaps that this equipment will span for more speedy operation.

WRITE TODAY—Without cost or any obligation, you will receive detailed descriptions of our new Jib Crane line plus more news on our Top Running Cranes.



Chicago Tramrail Furnace Crane at Work

CHICAGO TRAMRAIL COMPANY

2910 CARROLL AVE. Phone KEDzie 7475 CHICAGO, ILL.

Reclaiming Process Proves Value

(*Concluded from page 99*)

next smaller standard size and put back to work as new.

Further development in grinding wheel reclamation has been a sectional bond wheel which has one bond and grain size from the outside diameter down to the discarding diameter and another grain size and bond from that diameter to the arbor hole. All that is necessary is the progressing of the wheel from one machine to another.

Standardization of hole sizes for wheels and the setting of correct spindle speeds relative to wheel diameters are two outstanding factors in grinding wheel reclamation.

In another stronghold of reclamation gray iron borings are pressed into briquets. Borings are dumped into a pit, conveyed overhead into a storage bin, dropped into the hopper of the machine and then metered out for compressing. After briqueting they are sent to the foundry and charged back into the cupola as iron. Approximately 33 tons of the briquets are produced daily.

Aluminum turnings and borings are accumulated and segregated for conversion into essential parts, thus conserving any alloys contained. This careful re-use of aluminum and other materials is of even greater importance now as this country battles to conserve its vital materials.

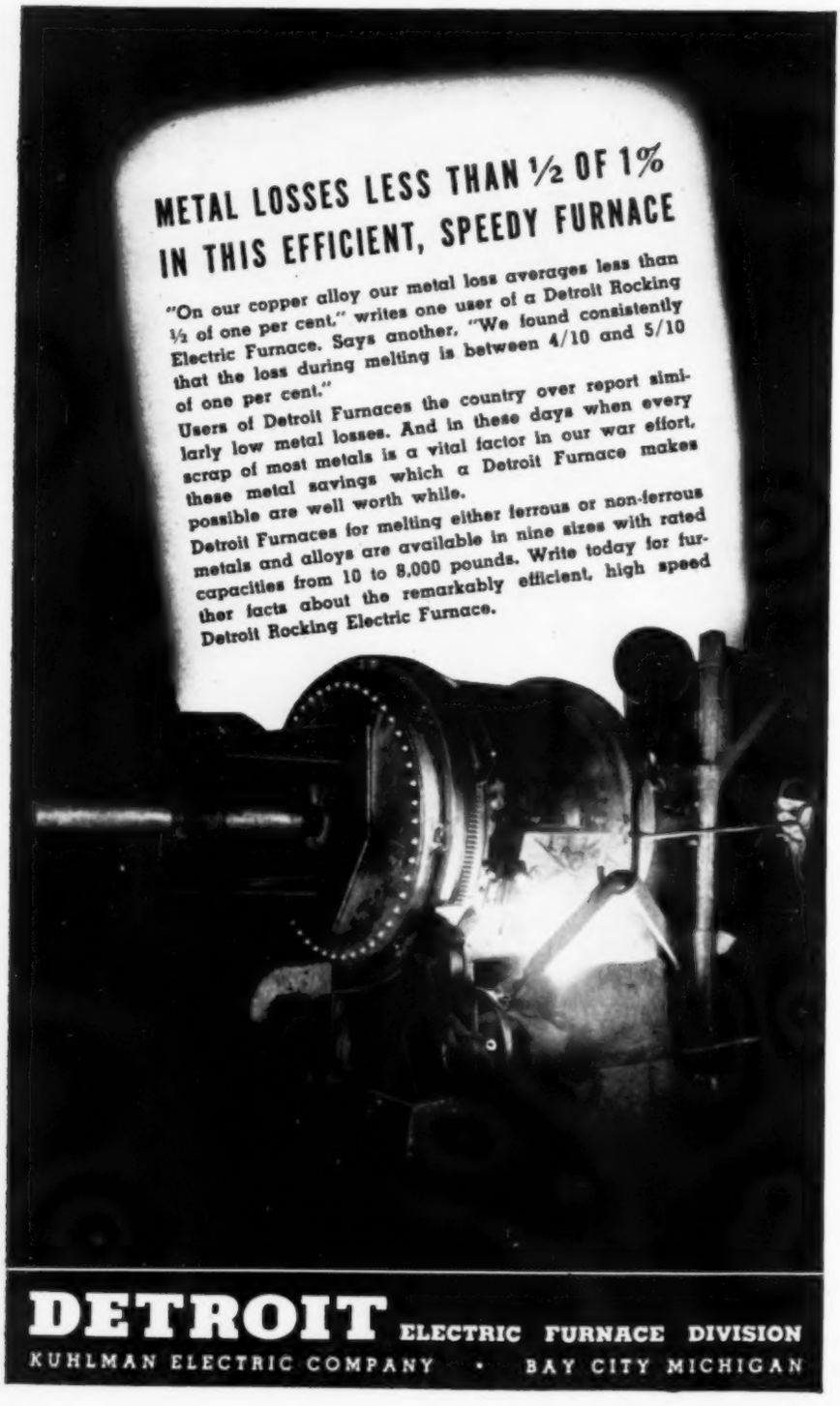
Scrapped advertising literature is separated into sheets and used in the foundry, replacing special paper formerly purchased. By far the most imposing looking part of reclamation is the scrap yard, located near the foundry. This is the focal point for an endless stream of scrap which is promptly examined and segregated. Each Monday the scrap yard faces a new week with its pile of heavy melting steel depleted and when the whistle blows to end the week the same condition exists . . . . but between times some 500,000 pounds are sent on order to the foundry. In its dealings with the foundry, reclamation functions like an individual company, receiving and filling orders in carload shipments the same as an outsider vendor—whether it is a carload of cast iron, compressed bales, heavy melting steel or alloy iron—in the quantity and at the time needed.

In this yard are apprentices taking the two-year welders' training course. Knowledge of cutting, under actual working conditions, is gained by these apprentices, in this department. Since all types and sizes of material must be reduced for foundry consumption—from light sheet metal to heavy steel castings and structural shapes—a wider cross-section of experience is available here than in any other department. A man's mistakes are seldom of any consequence inasmuch as he is producing scrap. The reclamation division as a whole, in fact, offers an ideal training course for apprentices, due to its broad scope of activities.

All material 12-gage and lighter, with no potential use except scrap, is compressed into bales for foundry use along with skeleton stock, wire, nails, slugs, stringers, rusty barrel hoops and other items known to industry as "hair."

To a company that manufactures its own parts, as does "Caterpillar," the scrap yard has a particular significance, for it returns to the foundry for reuse scrap steel and iron with an analysis already known.

H. C. Donaldson Co., Vernon branch, Los Angeles, has been appointed representative of the Foundry Equipment Division, Whiting Corp., Harvey, Ill., in California, Arizona and Nevada. The Donaldson organization also has a branch office at 116 New Montgomery street, San Francisco.


METAL LOSSES LESS THAN ½ OF 1%
IN THIS EFFICIENT, SPEEDY FURNACE
"On our copper alloy our metal loss averages less than ½ of one per cent." writes one user of a Detroit Rocking Electric Furnace. Says another, "We found consistently that the loss during melting is between 4/10 and 5/10 of one per cent."
Users of Detroit Furnaces the country over report similarly low metal losses. And in these days when every scrap of most metals is a vital factor in our war effort, these metal savings which a Detroit Furnace makes possible are well worth while.
Detroit Furnaces for melting either ferrous or non-ferrous metals and alloys are available in nine sizes with rated capacities from 10 to 8,000 pounds. Write today for further facts about the remarkably efficient, high speed Detroit Rocking Electric Furnace.
DETROIT ELECTRIC FURNACE DIVISION
KUHLMAN ELECTRIC COMPANY • BAY CITY MICHIGAN

PROTECTING LIFE PROPERTY AND PRODUCTION

(*Continued from page* 71)

walls and roof equivalent to 20 per cent or more of the floor area of the building. If temporary glass coverings are used it means a great deal of effort to cover such large areas of glass in the limited time after a blackout warning signal is received. It is recommended that temporary coverings for glazed areas be confined to factory offices and rooms that can be covered in a matter of 2 or 3 minutes.

Permanent coverings are always in place and blackout warnings need not disturb the factory routine as far as covering the glazed surface is concerned. Furthermore, all plants are equipped with illumination for night or dark day operation anyway so that the only disadvantage accruing from permanently blacked out glazed areas is the small amount of electric energy used for lighting during the daytime hours.

(b) *Temporary Coverings of Glazed Areas.* Temporary coverings that can quickly be put over the glazed areas may consist of material that will not allow the inside light to be noticed from the outside such as:

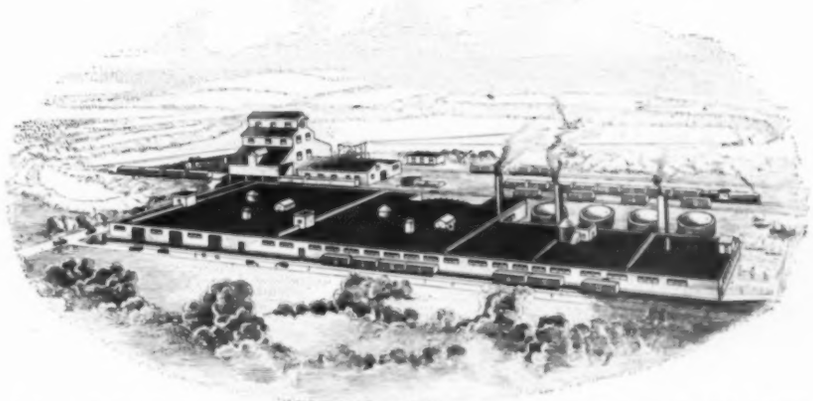
1. Heavy fabric curtain material which should be flameproof, fitting close to the face of the inside walls and overlapping the walls on the top, bottom and sides to form a positive light lock. These curtains can be hung on rods or be of the roller type.
   Caution: When curtains are used be sure the windows are closed so that drafts will not blow the curtains apart and allow light to be seen from without.
2. Sheets of beaver board, plywood, sheet metal and the like can be fitted closely into the window opening and close against the edges of the wall and then held firmly but lightly in place by fasteners so that no light is visible to the outside from around the edges. Handles may be attached on the inside of such sheets to facilitate their handling.
3. Windows equipped with fire shutters can be closed up with the shutters, provided all light leaks are stopped up and the shutters locked in place until they are opened.
4. None of the temporary expedients will offer much of any resistance to flying glass in case of a bomb concussion nearby unless the material in the room side of the glass is made of sheet metal, boards at least one inch thick or ¾-inch thick plywood and such window covering securely fastened to the walls so that the covering would hold firmly in place.

(3) *Permanent Coverings for Glazed Areas.* Permanent coverings for glazed areas are those coverings that remain in place and do not have to be handled every time there is a blackout signal. They have their advantage in that they always stay in place and are ready for an emergency. Properly installed originally there is no light showing through to the outside.

Permanent coverings should be installed on the outside surface to give maximum protection to the property for the reason that glass surfaces reflect any external light as from fire, and the glazed surfaces acting as reflectors show up in the dark and distinguish the object as a building. Any covering material naturally, should not have the ability to reflect light any more than the rest of

GOOSE LAKE

Fire Clay and
Fire Clay Flour
Fire Clay Brick
Therm-O-Flake Insulation



Goose Lake Clay Deposit with Clay Grinding and Fire Brick Plant

Illinois Clay Products Company

JOLIET, ILL.

the wall or roof surfaces.

Any glass surface covering may be used that will be permanent until removed and will resist the action of weather and outside temperature changes. Outside coverings for blackout purposes over glazed areas may consist of materials such as:

(a) *Solid Covering.* Sheets of plywood, matched boards, sheet iron or other sheet material securely fastened to the window frame or window sash and such material painted to resist the action of weather.

(b) *Paint Coverings*—Glazed surfaces can be painted with heavily pigmented paints that will not transmit light. Glazed surfaces should be properly cleaned before painting in order to get good adhesion of the paint to glazed surfaces.

Because of reports of glass caused by expansion due to heat of the sun, larger sized window panes 4 square feet and over in area when painted with black or other dark colors may break on account of the heat absorption of the dark colored materials. The use of lighter colors will minimize this tendency. This phenomenon is true regardless of type of paint or coating material used.

Painting of large panes of glass should be resorted to only as a temporary expedient when exposed to the sun.

(c) *Asphalt Coatings and Membrane*—A preferred method of covering glazed areas for a permanent blackout and antishatter breakout of glass is to cover the glass with either of two types of coatings and stick a membrane fabric material in the coating.

1. *Application.* The glass surfaces and the glazing bars, window sash and/or frame should be cleaned to remove all dust, grease and foreign matter. Do not apply the coating on wet or frosted surfaces. The coating may be either brushed or sprayed on the surfaces. Do not attempt to spray coating that contains any fiber unless suitable spraying equipment is used.

2. *First Coating.* The glass surface, glazing bars, window sash and/or frame should be covered with a coat of fire retardant asphalt coating on the basis of about 1 gallon per 100 to 150 square feet of surface. Coating should extend beyond the glass surface onto the sash not less than 4 inches or the width of the frame member in the sash or the window frame if a membrane is to be used. This asphalt coating may conform to either of the following specifications:

Asphalt Solvent Coating Specification

Softening point solid asphalt—Minimum 160 degrees Fahr.

Recovered solvent—Initial boiling point not less than 250 degrees Fahr. and a dry point of not over 450 degrees Fahr.

Slide test—When the coating is applied 1/16-inch thick on a panel of sheet metal or glass with a thread placed in the coating 1-inch from the bottom edge and parallel to the edge and the specimen hung vertically with the thread down for 4 hours at an air temperature of 140 degrees Fahr. and then cooled, there shall be no slippage downward of the thread.

Minimum asphalt content—50 per cent.

Maximum fiber or filler content—Not over 19 per cent.

Viscosity reducing agents and resin to prevent jellation—Not over 5 per cent.

Solvents—Balance.

CAUTION: Keep open flames away from this material when applying and until dry.

Asphalt Colloidal Clay Emulsion Coating Specification

Softening point not less than 105 degrees Fahr.

8 out of every 10 TRANSITE CORE PLATES are bought by steady, long-time users . . .

Experienced operators know that these non-metallic core plates are important factors in boosting production . . . and here are the reasons why:

EASY TO HANDLE—Lighter in weight than metal; operators can handle more plates with less effort.

STAY CLEAN—When both sides are used alternately, Transite Core Plates clean themselves.

HIGHLY RESISTANT TO CORROSION—because they are made of asbestos and cement.

STRONG—Fibrous; have unusual shock-resistance, minimize breaking and cracking.

REDUCE WARPAGE—Have a warpage tolerance as low or lower than metal plates.

ECONOMICAL—because of their low price, low handling costs and long life.

Because Transite Core Plates contain no critical materials, they help conserve materials for emergency services. Full details will be sent on request. Write Johns-Manville, 22 East 40th Street, New York, N. Y.

Johns-Manville
TRANSITE CORE PLATES

Flash point—Minimum 500 degrees Fahr.
Asphalt content—Minimum 47 per cent.
Water content—Minimum 48 per cent.
Mineral Colloid—5 per cent.
Asphalt colloidal clay emulsions, after drying, shall produce a film or coating that is not soluble in water.

3. *Membrane.* While the first coat of asphalt coating is still tacky lay into it the membrane. This membrane is to be laid in one piece over the glazed surface, glazing bars and window sash and/or frame, so that the lap on the sash or frame is at least 4 inches or the width of the sash or frame member. In this way the membrane ties the glass more rigidly to the glazing bars, sash and/or frame. The membrane should be firmly imbedded into the coating; lay loosely and do not stretch the material; press down all wrinkles. The membrane should be an open weave cloth such as tobacco cloth, heavy cheese cloth, etc. A suitable specification for the cloth is: Approximate weight per square yard 1.23 ounces, Approximate thread count—32 warp x 28 filling, Approximate tensile strength—18.8 pounds warp and 9.8 pounds filling.

If windows are made up of small panels where the glazed area of each individual pane is not over 120 square inches the membrane may be done away with and only one coat of asphalt relied on to help keep the glass from splintering. The membrane materially helps prevent excessive splintering and provides a safer job.

4. *Second Coating.* If a membrane should be covered with another coat of asphalt coating over the entire surface of the cloth at the rate of about 100 to 125 square feet per gallon.

5. *Removal.* An asphalt coating material can be removed later on by means of a putty knife and kerosene as a solvent.

6. *Condition of Interior Glazed Surfaces.* When asphalt coating is applied directly to the outside glazed surface, the inside surface is black. If it is desired to brighten up the interior of the building to reflect more artificial lighting within, slurry of lime, whitewash or casein paint may first be applied to the outside glazed surface and allowed to dry before applying the first coat of asphalt. Such practice permits washing the inside glazed surface to obtain better light reflecting qualities; also, it is a little easier to remove the coating when it becomes necessary to do so. Whitewash and the like can also be applied to the inside glazed surface if it is not felt necessary to apply it on the outer surface of the glass.

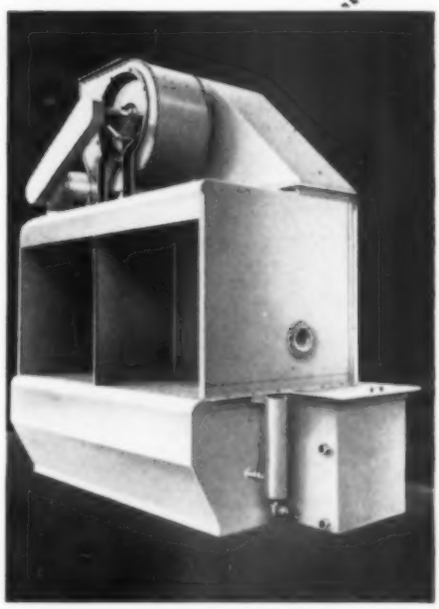
(d) *Blacking-out Wire Glass Surfaces.* Glass reinforced with wire is stronger than plain glass covered with asphalt and a membrane. A suitable treatment for wire glass that will eliminate the expense of the membrane and minimize splintering from the inside surfaces of the glass is to apply one coat of asphalt covering on both sides of the glass. The coat on the inside will minimize small glass splinters and the coat on the outside will eliminate the reflective surface of the glass.

A coating containing fibrous material is recommended to help reduce splintering effects.

(e) *Glass Coatings Without Membrane.* It will perhaps be difficult to obtain enough membrane cloth to reinforce the glass against splintering. If membrane material cannot be obtained, it is recommended that one coat of asphalt containing fibrous material be applied on the inside and outside of the window glass. Ap-

A VITAL UNIT IN AIR DEFENSE

Now YOU CAN PROCESS MAGNESIUM Safely....



The dangers of processing magnesium are eliminated with the introduction of Hydro-Whirl.

Because its chief component is a rotor (and not a pump which necessitates a screen that constantly needs attention) the results obtained through this unit are exceptionally effective. There is nothing to be clogged up by the lint produced by buffing wheels. The cleaned air is returned to the room.

SIGNIFICANT SAFETY FEATURES

HARDWOOD GRATING — *Eliminates danger of sparks.*

BOOTH LINED WITH MASONITE — *Added protection against spark ignition.*

Industrial SHEET METAL WORKS
Manufacturers of Hydro-Whirl Dust Collectors and Spray Booths, Ovens, Mechanical Washers and Industrial Ventilation Systems.

WRITE FOR FOLDER

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NEW YORK OFFICE
370 LEXINGTON AVE.

plication of asphalt on the inside surface will aid to some extent in preventing splintering and of course, the asphalt coating on the outside of the glass will prevent the glass from reflecting light.

(E)—*New Buildings.* For any new factory buildings that are in the course of erection or that may be erected during the war, consideration should be given to eliminating glazing of the building and in place, board or cover up the window openings until the war is over. Such a procedure would eliminate the labor and material necessary at this time for glass and possibly even the window sash.

(F)—*Light Tightness of Building and Structures.*

(1) *Checking the Building from the Outside.* After the buildings or other structures have been adapted to blackout conditions a thorough outside inspection should be made at night with all lights on and operations going on within, to determine whether there is any light leakage from the walls or roof visible either from the outside or from the air.

All cracks or imperfections in the exterior cladding of the structure should be repaired so that the wind and storms will not affect the walls and roof to permit light to show through.

(2) *Operating Sash, Windows and Louvers.* All operating sash and windows that are designed to open for ventilation purposes and all covers for louvers should be thoroughly checked to make sure that such equipment is in good operating condition at all times and that they will close tightly when it is necessary to close them for blackout purposes.

(3) *Light Locks.* Any ventilator openings through which the light may be visible from the outside should be provided with light locks so that ventilation may be maintained but will effectively shut off the light from outside view.

(4) *Reflected Light from Electric Arc Processes and from Other Sources.* Many times a building or other structure may not show an indication on the outside of the regular illumination from within but certain processes within such as electric melting furnaces, arc welding, flames from furnaces, etc., may produce a high intensity of light that will penetrate through openings and be reflected out of doors so as to be noticeable. This should be checked carefully.

(G)—*Light Locks for Doorways.* Light locks should be provided on all exterior wall openings for buildings and structures illuminated from within so that ingress and egress may be had without light showing outside. These light locks can be installed on the outside of the exterior walls and should conform to the general ideas portrayed as typical examples shown in Fig. 3 and 4.

(H)—*Blacking Out Fire and Glare from Metallurgical and Other Process Operations.*

(1) *Fire and Glare Noticeable on the Outside.* During a blackout at night or on dark, gloomy days, fires and glare from any kind of metallurgical or other processing operations that show from the tops of the stacks or chimneys should be effectively prevented from being noticed from above. Most metallurgical operations and other processes cannot be shut down on short notice without causing considerable damage to or complete destruction of the equipment or materials being processed; therefore means should be provided to continue the normal operation

(2) *Mechanical Devices.*

(a) *Built in Stack Devices.* Ordinarily a stack or chimney cannot be covered to hide the fire below

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Your foundry production schedules "Step Up" when all the various parts mesh like well tooled gears. Quality chaplets ready when you need them are an important cog in your schedules.

Whatever your needs may be, we'll gladly submit samples and prices.

Write us about Milwaukee Thread Stem Chaplets • Standard Radius Chills • Schmitz Chaplets • Patented Adjustable Radius Chills • Other Chaplets and Foundry Supplies.

because the heat from the operation will shortly burn up the covering device.

Mechanical devices are used successfully in European areas and such devices are available in this country but are relatively expensive to install and maintain.

In this country devices have been installed in cupola stacks and the like to knock down the ash and dust blown out of the stack where such contamination causes a nuisance. The device consists of an off-set in the stack so that the gases strike an oblique refractory arch covering the cross-section of the stack; the gas is deflected around this arch and then back into the upper portion of the original stack. Water jets are sprayed through the hot gases to cool them and at the same time to wash out the ash and dust. See Fig. 5 for a schematic diagram of this device.

NOTE: The only source available for this design at present, is the Whiting Corporation, Harvey, Ill. This is a patented item and the permission of the manufacturer should be obtained before using.

(b) *Built-Over Cover Devices.* It may be possible to build a large shed-like cover over the top of a stack that will permit the products of combustion to get away freely and at the same time prevent the fire and glare from being seen on the outside. If such devices are used they should be planned carefully for the particular installation and every precaution taken that the devices are effective and will not burn out during an emergency.

Care should be taken that the deflected ash and hot dusts thrown to the roof will not set the roof on fire. Fireproofing of the roof or other combustible materials should be resorted to. Means should be provided for the easy removal of all trapped ash and dust within such covers.

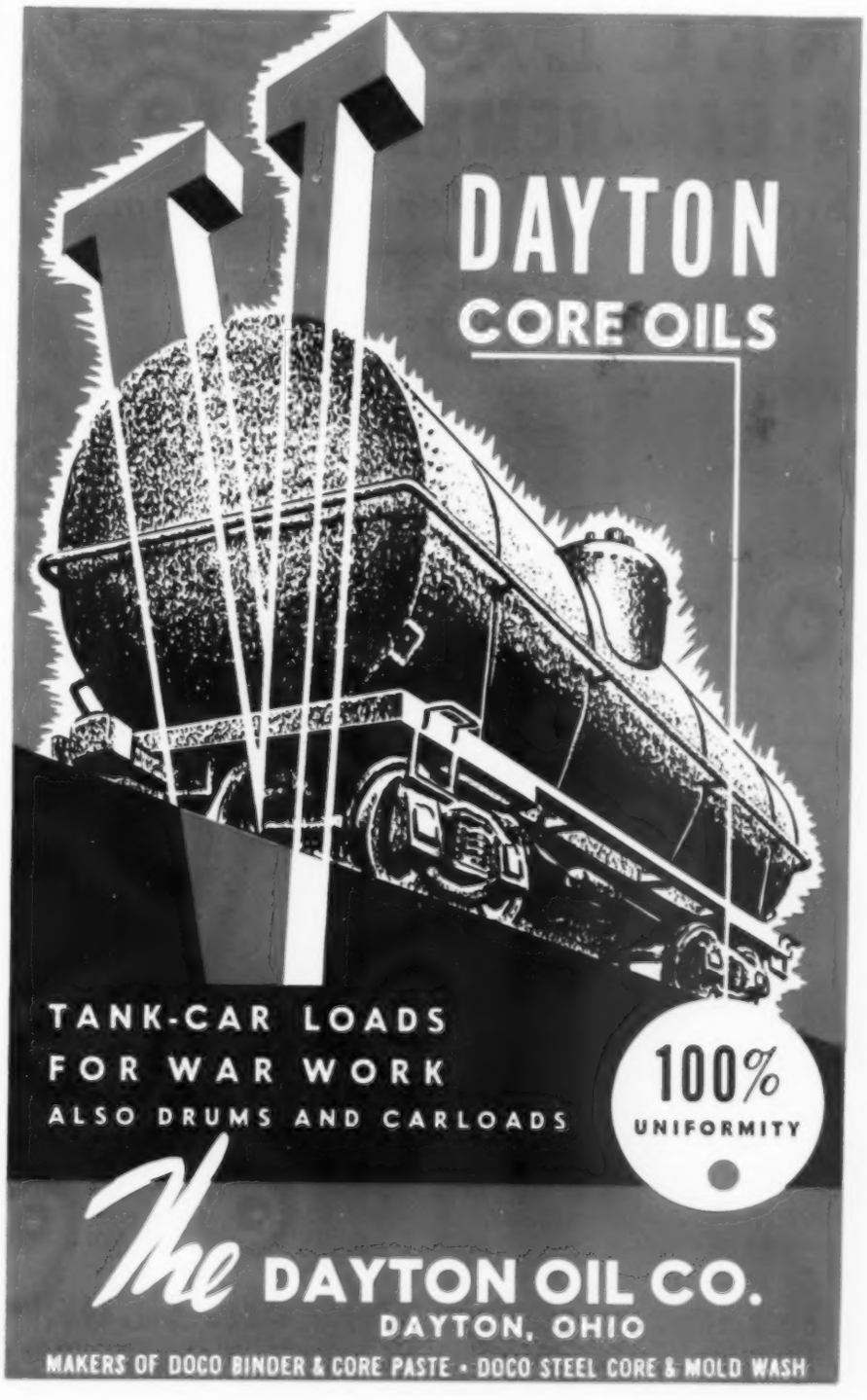
(c) *Smudging of Stacks and Chimneys.* A cheap and effective method can be employed although the human element is very much involved but trials and experiments are necessary to determine just how to handle the smudging. 1. *Cupolas.* Cupola melting units can be smudged with ordinary solidified roofing tar. There should be several barrels of tar on the charging platform chipped into three or four pound chunks. When a blackout signal is given, the chunks of tar are thrown into the charging door into the charge below. As the tar burns a dense smoke or smudge is created. Only enough tar is thrown in to maintain the heavy smoke condition. The smoke emanating from the top of the stack will do a good job of providing a smoke screen over adjacent buildings if the weather and wind conditions are somewhat favorable.

If a blackout occurs toward the end of the heat and the tar is thrown into a very hot charge, the tar consumption will be much greater and there is some danger of too hot a tar fire. It is best to keep a relatively cold charge on top to prevent too rapid burning.

The air blast volume and pressure can be reduced also to prevent a too rapid combustion of tar. The cupola bottom must not be dropped during a blackout as the resulting sparks and flame cannot be hidden from the outside either by smudging or ordinary mechanical means.

Old tar paper roofing can be cut into small pieces and thrown into the cupola and produce a good smudge. However, the paper should still contain considerable of the original tar content.

When a cupola is provided with hot blast equipment for preheating the blast air for combustion purposes by means of



drawing off the incompletely burned products of combustion in the stack below the charging door, it will be necessary to shut off the exhaust system which draws off the combustible gases from the stack in order that the smoke or smudge from the tar will not be drawn off below the charging door and thus permitted to pass up the cupola stack and be discharged from the top of the stack.

The usual canopy, shield or weather cap installed over the top of the cupola should be checked as to its condition and put in good repair so as to afford the maximum of protection, shielding the glare and flame within the stack from notice from above.

2. *Other Types of Stacks*

(a) *Stacks of Chimneys Connected Directly to the equipment.* Some types of melting and other operations in which the stacks and chimneys are an integral part of the equipment, produce a glare or fire within the chimney when viewed from above during certain times of the process. This is particularly true in connection with reverberatory or air furnaces for melting of malleable iron and other ferrous materials. The stack temperatures are so high in this type of operation that the stacks cannot be covered; neither can the fires be turned off during an emergency without disastrous effects to both the equipment and the product being melted.

The products of combustion in such stacks are usually too hot for artificial smudging to be introduced into the stacks or chimneys, and the combustible matter contained in the smudge would burn up in the hot products of combustion and there would be little or no visible effect of covering the flame or glare from above.

Furnaces of this type are either hand coal-fired or are equipped with fuel oil or powdered coal burners.

When a heat of metal is being finished off preparatory to tapping, that is the time the flame and glare are most objectionable in the stack, and this can be overcome during emergency periods of blackouts if the volume of air blast is reduced on the oil or pulverized coal burners or the blast reduced under the grates of the hand-fired furnace and the blast in the top arch reduced so as to give a heavy reducing flame action within the melting unit. This will stop the flame from being carried back to the stack or chimney and will produce a dense cloud of smoke due to incomplete combustion.

In instances where the heat of metal is ready to be tapped, it will be necessary to coast the furnace along until such time as the emergency is over, when the heat can again be applied and the metal finished preparatory to tapping.

(b) *Stacks and Flues Serving Other Types of Melting Equipment but Not Connected to the Equipment.* There are numerous types of furnaces, such as crucible, rocking, rotating and the like that discharge their products of combustion into a hood connected to a stack or flue discharging out of doors.

In such instances, due to the fact that the products of combustion are only caused to flow through these stacks or flues by the heat of the products of combustion, it is possible during a blackout period to provide a tight fitting cover hinged at the top of the stack or flue that can be dropped into place over the top of the stack or flue, thereby cutting off all source of light from below. This situation of course, contaminates the atmosphere within the building, and if

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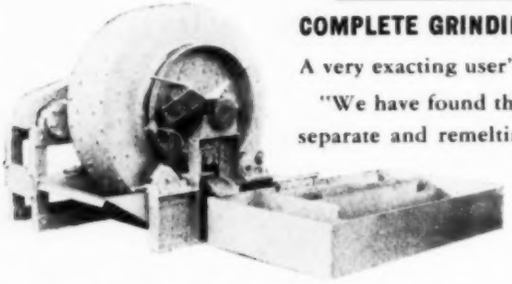


Above — Rate of Feed — 800 to 1200 pounds per hour. No. 4 size Mill — complete with settling tank. Also No. 5 size—not shown.

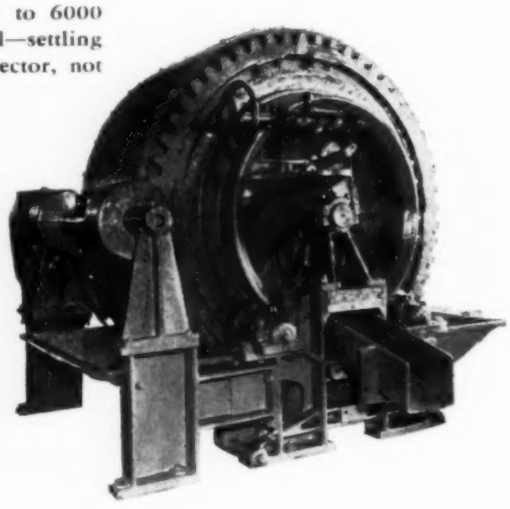
COMPLETE GRINDING AND CONCENTRATING UNIT

A very exacting user's statement:

"We have found that by keeping these types of dross separate and remelting the metallic content after processing in your mill, that a suitable ingot can be procured which can be melted directly back into specification production"

INSTALLATION COST RETURNED IN 3 TO 12 MONTHS

At right — Rate of Feed — 3000 to 6000 pounds per hour. No. 6 size Mill—settling tanks with automatic Sludge Ejector, not shown.



WAR DEMANDS PRODUCTION WITH EVERY POUND OF METAL

TOTAL RECLAIMING COSTS FROM 1 10 TO 1 4 CENT PER POUND. MOST EFFECTIVE AND LOWEST MILLING COSTS WITH MANGANESE STEEL CRUSHING ROLLS, WITH FLEXIBLE MOUNTING TO PASS MILL FEED SIZE PIECES. WRITE FOR BULLETIN "M".

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there is no reasonable means of obtaining the necessary amount of ventilation, such stacks and flues can be constructed with an offset above the roof line and no cover used over the stack or flue outlet so that no light or glare is noticeable from above.

3. *Metal Converters.* Where converters are used in metallurgical operations, it is sometimes difficult to house the discharge of the converter in such a manner as to hide the light from the blow. If the converter is of small capacity it is sometimes possible to build a house around the blow discharge of the converter and connect such housing to an off-set stack that would conceal the light of the blow from above.

Where it is not practical or possible to build a house over the converter, and a blackout warning signal is received, the heat of metal will have to be finished and then subsequent blowing operations stopped until after the emergency is over. As a rule, the maximum time of a blow is only around 12 minutes.

The local air raid warden in the community should be contacted to determine how much time will elapse between the arrival of planes and the warning signal given to the community so as to ascertain probable time element in connection with converter operation.

(I)—*White Smoke and Vapors.* White smoke, steam and vapors are readily discernible at night from above. If the sources of the white smoke, steam or vapors cannot be immediately shut off, means should be provided in the way of smudge pots to black out the white vapors, steam and smoke and make them less conspicuous.

(J)—*Grease Fires in Stacks.* Careful attention should be given to frequently cleaning out the stacks which accumulate grease and oils, so as to minimize possibilities of a grease fire occurring and burning within the stack during an emergency period. Stacks serving core ovens and many other types of equipment from which an oily or greasy residue is given off shall be carefully checked periodically.

(K)—*Emergency Interior Lighting.*
(1) *Limitation.* If a plant does not operate during the night hours or if the type of occupancy does not warrant blacking out the glazed area such as warehouses, store rooms and the like, emergency interior lighting should be provided so that no light will be perceptible from the outside and yet there will be a minimum of lighting inside in order to evacuate the occupants or to make patrols effective over the area.

(2) *Amount of Light.* The amount or intensity of illumination to be provided is very small. Recommendations for such lighting will be issued by the Office of Civilian Defense.

(3) *Emergency Lighting Installations and Change-Overs*

(a) *Use of Present Lighting Systems.* Any type of emergency lighting to be employed should use as much of the present lighting equipment now installed and yet be effective in a blackout. Mercury vapor, high intensity mercury and fluorescent lighting systems cannot be used as these types of lighting are not adapted to turning down the light intensity by voltage control. No light bulb should be discernible from above at an angle of 90 degrees or less with the vertical.

(b) *Lamps Mounted in Reflectors and Fixtures.* Specifications for lamps mounted in reflectors or for lighting fixtures will be available in the lighting recommendations to be issued by the Office of Civilian Defense.

(c) *Rheostat Control.* If the general lighting system is of the

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MAEHLER

mazda filament type, a rheostat can be located in the main lighting circuit and the voltage dropped to the required dimness.

In a room provided with a separate lighting system for watch service, the regular shop lighting system can be turned off and a rheostat provided in the separate watch circuit and turned down to the required dimness.

(d) *New Emergency Lighting Circuits.* If none of the present lighting systems can be used for providing a minimum of light during a blackout period, either of the two following methods may be adopted. In any case the lighting should be installed in main aisles and over strategic equipment and areas that should be kept under observation.

In either type of installation, lamps should not be placed closer than the suggestions for lighting recommendations soon to be issued by the Office of Civilian Defense.

Do not locate lamps too close to windows; place them opposite pilasters or other obstructions.

1. *Installations Using Reflectors.* Office of Civilian Defense will issue specifications for lighting recommendations for emergency lights to be used in buildings with normal ceiling heights.

No attempts should be made to mount any emergency lighting in high vaulted rooms or rooms served with high overhead cranes because any lighting that would be effective at floor level would be too brilliant.

In such cases it may be possible to mount lights from the wall or columns at normal height or even install portable lights mounted on floor stands provided suitable reflectors are used.

2. *Neon Glow Lamps.* Emergency lighting can also be used consisting of 2 or 3 watt neon glow lamps without reflector installation. If such lighting is provided, it is imperative that the glow lamps be installed at least 6 inches above the top of the highest window in the room. This type of lighting is somewhat different from the light obtained under reflectors in that the light gives a silhouette effect to objects between the light source and the observer.

(e) *Signs and Indicators.* Signs or directional indicators can be made by using a ½ watt neon glow lamp inside a box or other receptacle so that the light shows through the cut out portion of the face of the sign. The face of the sign should be protected from being seen from above outside the building and such signs should not face clear windows or other openings.

NOTE: The lamps specified in the foregoing can be obtained from most any lamp manufacturer and will work on alternating or direct current.

(f) *Reflection.* Even the dimmest of lights may reflect out of doors through windows and wall or roof openings from the surfaces of liquids in containers within, or from highly polished or mirror finish machined surfaces on tools, equipment or product. Steps should be taken to cover over any surfaces that cause reflection.

(g) *Checking for Obscurity.* If emergency lighting is employed, the building should be carefully checked at night from the outside to make sure of the effectiveness of the subdued lighting system and should also be checked for reflected light.

This is the third installment of the code prepared by the Industrial Hygiene Codes Committee of the A.F.A. under the chairmanship of J. R. Allan. Previous sections appeared in the May and June issues and the concluding installment will be presented in the August number. Copies of the complete code may be obtained from the A.F.A. headquarters in Chicago for $1.50.

THE EDITORS

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For All-Out War Production

ALL TYPES AND SIZES

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Hausefeld Furnaces are available for melting all non-ferrous metals and their alloys. Tested before shipment.

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NYA TRAINS FOUNDRY WORKERS

(*Concluded from page 77*)

we have employed in our plant. We feel your organization has done a wonderful job in starting this emergency program and aiding us in securing qualified workers to meet our needs. If you can supply us with 100 foundry workers within the next month we shall be more than pleased to employ them."

Youth employed in NYA foundries are gaining a background of experience in the various phases of iron and nonferrous foundry work, in the production of a general run of castings for machines for NYA use and various other articles for the use of public cosponsors. All work done for sponsors is solely for the benefit of tax supported agencies and consists of articles which the agencies could not provide for in their normal budgets. In some cases sponsors supply the patterns. In others the patterns are turned out by NYA pattern making shops operated in co-operation with foundry projects. The average foundry training project has a capacity of 1 to 1½ tons per heat. In each NYA foundry or other shops, young men are given practical on the job training in actual production work.

Operates A Foundry

Typical of the NYA training projects for foundry workers is the foundry now being operated in Tulsa, Okla. Situated in an abandoned warehouse belonging to the city water department, this project is turning out gray iron castings. The principal item has been water meter lids for the city of Tulsa. Considering that the workers entering this training shop are entirely unskilled, a good production record has been set.

The hundreds of young persons who are obtaining jobs in foundries operated by private industry are but a portion of the thousands of NYA trained young men and women who are going into industry every week. During the past 12 months 430,000 of these young men and women obtained regular jobs in industry. Thousands have gone into jobs in aircraft, shipbuilding, ordnance production, and other industries making direct contributions to the war effort. Many others have gone into the equally important communications and transportation industries.

The NYA training and work experience program has been developed in close co-operation with industrial and business leaders. Advisory committees, with business and industry represented, have been set up in 1500 communities to assist in gearing local projects to the needs of youth and industry. More than 2100 leaders in industry and business are serving on these committees without compensation.

National Metal Congress and National Metal Exposition will be staged in Cleveland instead of Detroit as originally announced. The convention will be held Oct. 12 to 16.

Veteran Employes Are Honored

Employes of the Foxboro Co., Foxboro, Mass., who have completed 25 years or more in its service were guests of the company at a celebration held May 26. A jeweled service pin of gold was presented to each of the 50 men and women thus honored, and a program of entertainment, supplemented by the reminiscences of old timers, made the occasion an enjoyable one. The Foxboro Co., makers of instruments, was organized in 1908.

GATES and RISERS in any metal

in far Less Time with

Tannewitz METAL CUTTING BAND SAWS

Variable Speed

Models to fit Every Need

In addition to our regular High Speed Band Saws delivering over 2 miles of smooth vibrationless saw travel per minute, which have proved so exceedingly popular in automotive and aviation work, the TANNEWITZ line now offers five other models to provide the fastest cutting medium for every foundry need: a 30" machine to provide any speed from 300 to 900 blade feet per minute—a similar machine with 3-step V-belt drive to give 2300, 3100, 4000 blade feet per minute—a 36" machine with 32" capacity under the guide—a model with 48" wheels and one with 52" wheels, operating at 3,000 blade feet per minute for handling extra large castings. Get a line on the TANNEWITZ metal cutting band saw that fits your particular needs. It will save time, step up production and repay its cost dozens of times. Write for full particulars NOW!

THE TANNEWITZ WORKS, GRAND RAPIDS, MICHIGAN

CARRIES ON APPRENTICE TRAINING

(*Concluded from page* 76)

long gone by when traditional qualifications included nothing but a weak head and a strong back. A base canard quoted in amused toleration among the foundrymen themselves, but violently refuted and resented when used by outsiders.

The regular indentured apprenticeship program calls for 4 to 5 year's training. This of course includes the time the apprentice spends in the class room where he receives instruction in mathematics, drawing, metallurgy and other related subjects that qualify him later as a candidate for executive or supervisory position. Development of the apprentice mental equipment is fully as important as the development of manual skill and dexterity. Graduate apprentices gave industry its foremen and supervisors in the present emergency.

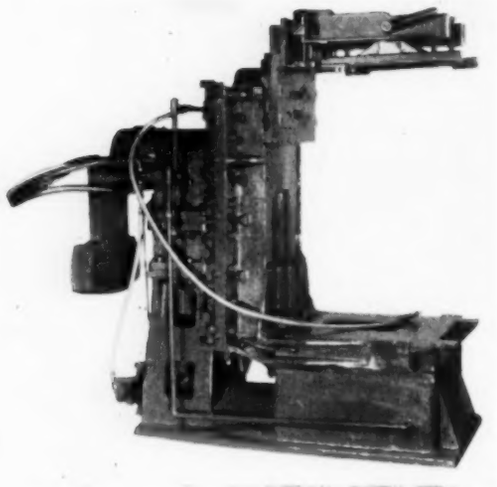
Rate of pay for a beginner is low compared to the pay of a journeyman mechanic, but it is sufficient for maintenance and is far in excess of the highest rate paid to finished mechanics even 25 years ago. However, while the starting wage is low, it is increased usually at 6 month intervals in recognition of the apprentice's increased value to the employer.

Contracts between employers and employes customarily are for 12 month periods in recognition of the fact that basic changes in conditions may arise during that time. Contracts between an employer and an apprentice are for the entire period of apprenticeship, usually in the foundry, 4 years. This form of contract has a stabilizing influence on the conduct of both parties during a period in which certain changes in the dollar value of services are anticipated. Except under extraordinary circumstances the apprentice is assured of continuous employment and gradual experience on more advanced work. The employer is assured the apprentice will not run out on him at a time when his services are an asset instead of a liability. At the conclusion of the apprenticeship the boy receives a diploma signed by the state and by the employer, which if considered necessary or expedient serves as a passport to available jobs in any locality.

Apprenticeship training provides the boys with cultural as well as educational advantages and opportunities. Friendships are promoted through clubs which meet regularly for business and social functions. Opportunity for community and national competition is provided by the American Foundrymen's Association, by sponsoring contests in molding and pattern-making.

GRIMES MOLDING MACHINES

HAND AND POWER ROLL-OVERS FOR CORE ROOM AND FOUNDRY



1000 lb.Capacity Jolt Roll-Over
22″ Pattern Draw

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WITH AUTOMATIC PROPORTIONING OF INGREDIENTS, ENGINEERED, FURNISHED AND INSTALLED

We are ready at any time to consult with you — WRITE or WIRE...

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Records Progress of Fifty Years

Commemorating its fiftieth anniversary, the Mathieson Alkali Works Inc., 60 East Forty-second street, New York, recently published a most interesting and attractive 48-page booklet entitled "Fifty Years of Chemical Progress." The booklet traces growth of the Mathieson organization and describes the company's major developments, which include the introduction of liquid chlorine and synthetic ammonia, the preparation of new chlorine carriers, bleaching agents, and the preparation of alkalies. Information is given on the development of fused alkalies in briquet form used to desulphurize and refine cupola metal in the forehearth or ladle equipment. Numerous illustrations show the scope of the company's operations.

CASTS STEEL ANCHORS VERTICALLY

(*Continued from page* 68)

Trading Into Hudson's Bay wearily paddled his birch bark canoe up the Assiniboine and chopped down a few trees to form Fort Garry. Contrary to a somewhat nebulous and hazy belief among some members of the rising generation, this stout hearted lad did not establish the Vulcan Iron Works, but it was among the first, if not actually the first to produce iron castings in the great inland empire. Several years ago an electric furnace was installed for the production of steel castings.

Method and equipment for molding and casting steel anchors are shown in the accompanying illustrations. The mold is made flat in a two part flask in the usual manner and then turned up on end before it is filled with metal. Two large, high feeding risers supply metal to compensate for the natural shrinkage and also furnish ferrostatic pressure to insure dense, solid metal throughout the casting. The method has resulted in the production of over 700 perfect castings.

Molded In Steel Flask

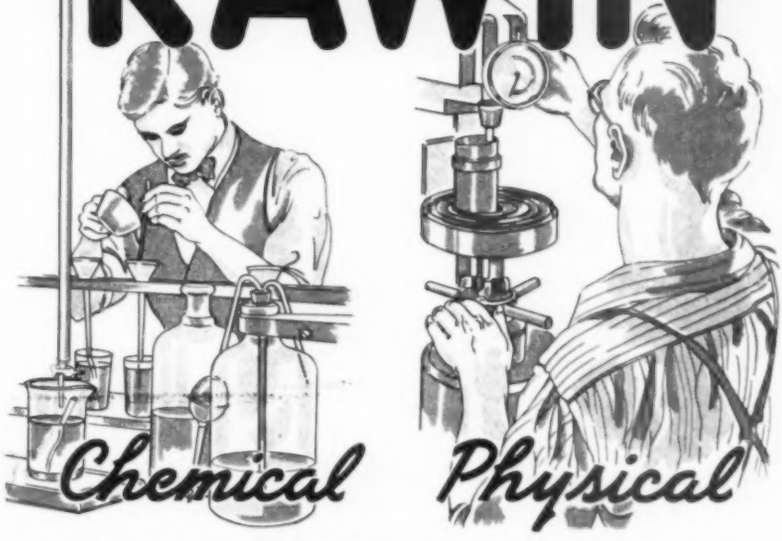
The mold is made in a heavy steel flask 6 feet 4 inches x 7 feet, cast in sections and bolted at the corners. To reduce the amount of sand required in the mold, each flask half is 2 feet deep at one end and 1-foot deep at the opposite end. Two semicircular openings in the deep end of each flask half, provide space for the 14-inch diameter risers when the mold is closed. A smaller opening in the lower right corner of the deep drag end is for the sprue, built in cores to extend to a point slightly below the junction of one of the flukes with the head. Metal falls vertically to the bottom of the sprue, then travels a short distance horizontally and then at right angles enters the gate leading to the mold cavity. Sprue, runner and gate as they appear attached to the castings are shown in Fig. 1. The gate opening into one side of the fluke is shown in Fig. 2. A wide, flat channel conducts the metal from one fluke to the other, insures even filling of the mold, and later in the solidified form serves as a tie bar to promote uniform contraction and prevent distortion of the casting. A small well or extension at the tip of each fluke takes the first metal that enters the mold and thus prevents any formation of shot, missrun or cold shut form of defect. These extensions, with the tie bar, gate and risers are cut off in the cleaning room.

After the cope and drag are parted, the pattern is removed, the mold is finished, painted with a silica wash and skin dried with charcoal fires. Then the cores are placed, the mold is closed and after the cope is bolted to the drag, the entire mold is upended and lowered into a pit where sand is rammed tightly around it. The risers are built up an additional 13 inches, or to a total height of 32 inches above the top of the casting. The runner basin is adjusted and the metal is poured into the mold. Total weight, casting, runner and risers is 4½ tons.

Carbon range of the steel for these castings was held between 0.24 and 0.28 per cent. Annealing cycle included 12 hours heating up to a temperature between 1650 and 1750 degrees Fahr., holding at maximum temperature for 72 hours, and cooling in oven 18 hours, a total period of 102 hours.

In a specified percussion test the casting is raised to a height of 15 feet and then dropped on a steel slab set in a solid concrete foundation. In a hammer test the an-

KAWIN



LABORATORY SERVICE

ACCURACY, rapidity, and reasonable cost characterize Kawin Metallurgical Laboratory Service to foundries. Available in unit or agreement basis, as you prefer, we invite your inquiries regarding the manner in which your physical and chemical testing can be performed. Typical of some materials regularly tested for foundry clients are these:

Irons	Aluminum	Coke, Coal	Minerals
Steel	White Metal	Fuel Oil	Sand
Brass	Babbitt	Fluxes	Core Oil

We provide you with special envelopes to facilitate the mailing of samples to our nearest laboratory for testing. Reports are made to you by code, wire, telephone, or mail, as you wish. Hundreds of foundries rely upon this service.

This and a foundry engineering service backed by 38 years' experience in all types of foundry work is available. Why not drop us a line and learn how we may serve you?

Special Specifications and Control Methods Available

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chor suspended in a sling must ring clearly when struck all over with a 7-pound sledge hammer. In the bend test a test piece from each casting 1-inch diameter and 8 inches in length is bent cold through an angle of 90 degrees over a 1½-inch radius. Minimum acceptance tensile strength per square inch is 26 tons (58,240 pounds) and maximum is 35 tons (78,400 pounds).

Republic Steel Corp. has completed a new blast furnace in the Southeastern section of the United States 5 weeks ahead of schedule. The furnace was blown in May 28.

Tin Consumption Is Reduced

In a recent address before the American Institute of Electrical Engineers held at Schenectady, N. Y., John Horn of General Electric Co. engineering general department mentioned how his firm was saving scarce metals. He said, in speaking of tin, that to date most progress has been made in reducing the tin consumption in babbitts and solders although the field of bronzes offers a very promising opportunity for sizeable over-all savings of tin.

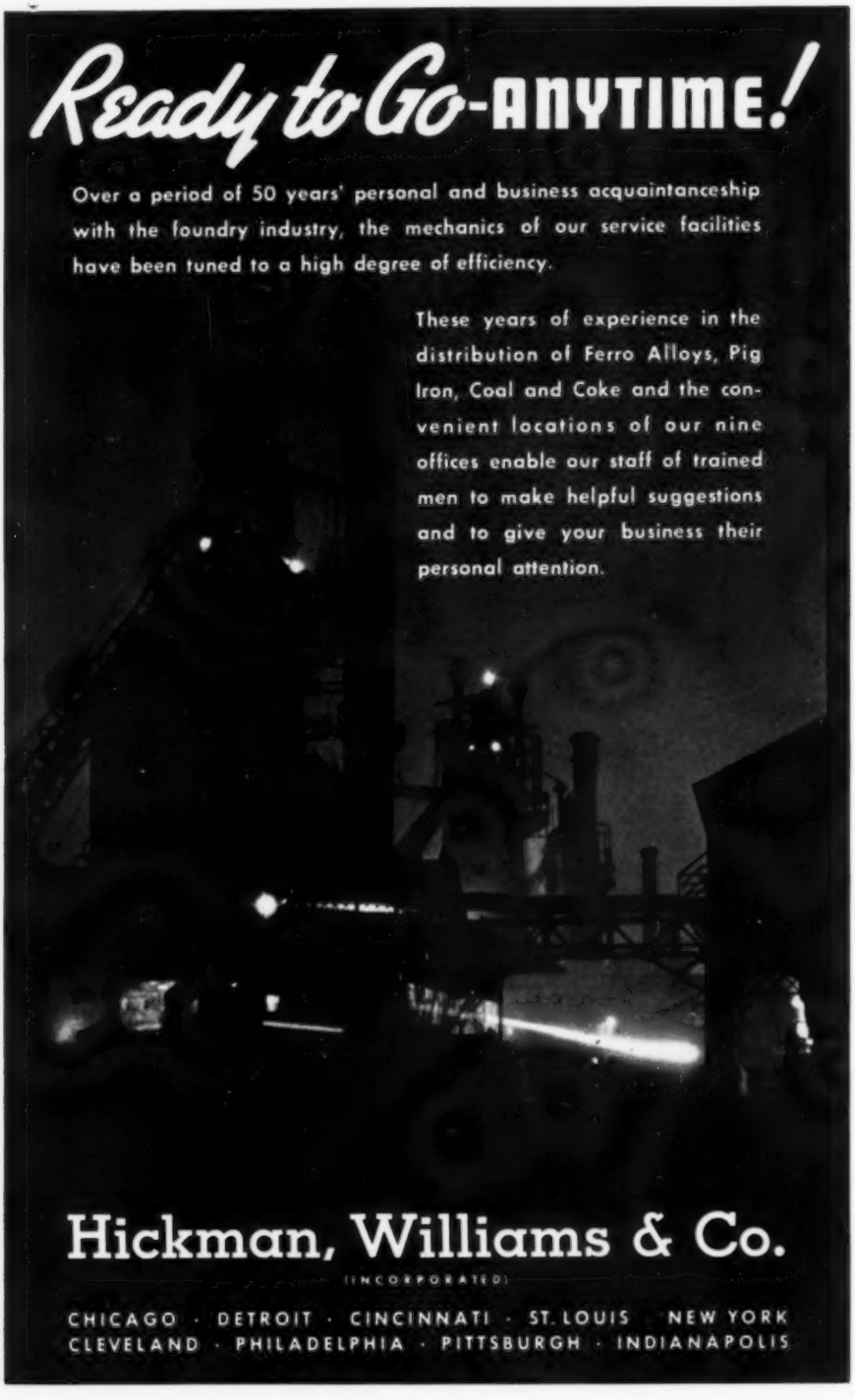
"The principal reason for the less extensive progress made with the reduction of tin in bronzes," he said, "appears to be the lack of broad foundry experience with most of the low tin and tin free compositions which can be used as alternates. In some quarters also the 'zinc shakes' which are encountered in casting zinc containing alloys figure as obstructions that can be overcome only by improved ventilating provisions which are not always readily installable."

He pointed out that the standard babbitt used by his firm for rotating apparatus bearings for a number of years contained 83 1/3 per cent tin. After detailed investigations and tests a lead-base babbitt containing 82½ per cent lead, 15 per cent antimony, 1 per cent arsenic, 1 per cent tin and ½ per cent copper was found to be a satisfactory alternate for centrifugally cast sleeve bearings. As a result manufacture of that type of bearing in various motor departments has partly been changed over, and in the process of conversion for the remainder. The resultant saving of tin is estimated conservatively to be of the order of 200,000 pounds of tin per year at the present rate of production.

Applies Brushes to Cleaning Metal

Osborn Mfg. Co., Cleveland, has expanded its war-effort brush-engineering field service to co-operate with war plants. Particular attention will be given to work such as cleaning castings, burr removal, removal of slag, scale or oxidation from welds, etc. Men appointed to the engineering field service are: Page A. Mead, formerly with the Johns Conveyor Division of the company, now located in Delmar, N. Y., and serving the eastern portion of New York state; Paul A. Malling, formerly in the western New York territory, now located in Fairlawn, N. J., and covering New Jersey; William F. Short, formerly with Reeves Mfg. Co., Dover, O., now located in Hamburg, N. Y., and serving Buffalo and western New York state; Max Sherwood, formerly with the Johns Conveyor Division, now located at the company's Chicago office; Gilbert B. Pecsok, formerly of the Cleveland office, now located in New York; and Ralph B. Jones, formerly sales-service manager, now working out of the Cleveland office.

Whiting Corp., Harvey, Ill., has started a building program which will add approximately 55,000 square feet to its manufacturing facilities. It is estimated the plant addition will cost approximately $325,000 not including the required tools.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Over a period of 50 years' personal and business acquaintanceship with the foundry industry, the mechanics of our service facilities have been tuned to a high degree of efficiency.
These years of experience in the distribution of Ferro Alloys, Pig Iron, Coal and Coke and the convenient locations of our nine offices enable our staff of trained men to make helpful suggestions and to give your business their personal attention.
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CONDITIONS AFFECT QUALITY

(*Continued from page* 79)

too long before pouring so that hydrogen is not absorbed by the metal in the furnace.

When the sulphur is desired below 0.12 per cent to prevent hot shortness or hardening of the iron, it can be reduced to some extent by ladle treatment with soda ash.

Sulphides are rendered ineffective by having adequate manganese present to form manganese-sulphides instead of iron sulphides. The rule for the minimum manganese required in cast iron is 2 x S + 0.15. In the case of steel, hold the metal on the oxidizing side during the melt to produce the proper manganese sulphide distribution.

Melting temperatures must be high enough to provide correct metal temperatures at the mold. Overheating is wasteful and often bad for the metal. Hot metal tapped into the ladle means little as to quality unless the metal poured into the molds is at the proper temperature. Metal temperature losses are incurred by the long time required to accumulate metal at the furnace, and by poor supervision of the distributing system in the foundry. To aid in securing good pouring temperatures for all molds, preheated and insulated ladles are preferred and rapid handling of metal is essential.

Pour Hot Metal

Gases and solid inclusions generally have a better chance to be removed from the mold when it is filled with hot metal than when filled with colder, and therefore, more sluggish metal, because the high temperature metal provides a greater time interval between filling the mold and freezing or setting of the metal. For example: Molds filled with steel at 2950 and at 2750 degrees Fahr. will be molten in the mold for different lengths of time, permitting better separation of the inclusions and gas from the metal poured at 2950 degrees Fahr.

Pouring speed also is related closely to pouring temperatures. For, if a mold is slowly filled with metal of the proper temperature, the first metal poured may freeze before the last metal enters the mold, which is the same in effect as pouring the mold with cold metal.

Because of high melting temperatures, molten steel readily absorbs gases, the most harmful of which is hydrogen. These gases may be reduced to a minimum by melting under oxidizing conditions and also by insuring that any late additions to the melt (ferroalloys, lime, etc.) are free from moisture. After the melt-down the heat should be brought up to temperature as rapidly as possible, deoxidized and poured as soon as the deoxidizers have had time to diffuse.

Pouring temperatures (2750-3000 degrees Fahr.) depend upon the composition and upon the type and size of castings. Large castings usually are poured on the cold side to prevent attack of the refractory mold walls, while small castings are poured on the hot side to insure filling the mold cavity. High temperatures do not always insure good fluidity[2], but other things being equal, fluidity increases in plain carbon and low alloy steels with increase in temperature.

It is the practice in many steel foundries to add aluminum to the ladle, even though the heat already has been deoxidized in the furnace with silicon and manganese. Addition of aluminum, particularly if the castings are poured in green sand, is very potent in preventing pinhole trouble because of its high deoxidizing power. Very small additions, however, may impair the ductility

Castings on the move

Whisk them through the Foundry;

Zip them through the Cleaning Room.

Use the following to shorten long jobs and eliminate unnecessary ones.

LION BINDER - A strong, fast drying paste; tie wires not needed. A strong binder that bakes very fast.

EASY CLEANER CORE COMPOUND - Makes cores that clean out of the castings readily.

VULCAN BLACKING - Can be adapted to swift application; gives good surface, cleans speedily.

DUST-ON FACING - Shake it on green sand molds, close and pour. No tooling. Fast cleaning.

SUPERIOR PLUMBAGO - Rubs in immediately; doesn't "lift" the sand - - peels beautifully.

SILKOTE - Paint or spray on steel foundry cores, dry sand molds and skin dried work. Adaptable to fast application. Casting surfaces are really clean.

Manufactured only by

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FOUNDRY FACINGS · SUPPLIES · EQUIPMENT

of the steel. ("Effect of Aluminum on the Properties of Medium Carbon Cast Steel", by C. E. Simms and F. B. Dahle, Transactions, A.F.A. Sept. 1938). Current practice indicates that approximately $1\frac{1}{2}$ to 2 pounds of aluminum per ton of steel is desirable.

It is general practice in steel foundries to pour large castings from bottom pour ladles, and to pour small castings from small hand ladles or shanks, although many foundries bottom pour all castings from one ladle. Frequently hot metal or piping compound is added to risers after the castings are poured to assist feeding, but there are other factors that should receive more emphasis in producing sound castings. It is more important that freezing be controlled by the casting design and position of gates and risers than only by the metal temperature and the pouring speed. Effort should be made then to utilize to the best advantage that pouring practice which will permit control of the solidification by the principles as recommended in several recent papers by Duma and Brinson[3] and others in the A.F.A. Transactions.

An optimum melting temperature range of 2700-2900 degrees Fahr. is recommended for gray iron. The lower range is high enough for heavy castings if the metal is handled so that the pouring temperatures do not go below 2600 degrees Fahr. The lower melting temperatures, however, mean more inclusions in the castings trapped by the sluggishness of the metal.

Melting temperatures in excess of 2900 degrees Fahr. tend to produce the superheated structure characterized by the fine dendritic graphite[4] which is undesirable in producing both decreased wear resistance[5] and lower mechanical properties[6].

Other factors which tend to produce fine dendritic graphite are: (a) The more rapid freezing of light sections, (b) Pouring temperatures of less than 2500 degrees Fahr., and (c) the more hypoeutectic irons.

To minimize the formation of this undesirable dendritic graphite, we can make ladle additions of powerful innoculants[6] such as silicon which are often accompanied by alloys such as nickel[7] and molybdenum[8] to achieve machinability and high strength. Ferrosilicon as an inoculant in ladle additions of from 0.20 to 0.50 per cent often are employed using the 75 to 85 per cent grades of ferrosilicon of the coarser meshes, ($\frac{1}{4}$ to 1 inch). That is to say, if we wish to have 1.80 per cent silicon in the castings, we would tap out of the furnace 1.50 per cent Si metal and add say 0.30 per cent Si at the spout with other alloys which we may be adding at this time.

Alloys Dissolve Readily

It has been found that the more concentrated grades are usually more convenient because less total addition need be made. The coarser meshes of ferrosilicon are more effective as they are not so easily oxidized and are dissolved very readily by the metal at 2700 degrees Fahr. and above. The greater tendency to produce dendritic graphite requires more silicon—for example, a 2.50 per cent total carbon iron requires 0.50 per cent, while a 3.25 per cent total carbon iron may require only 0.20 per cent Si to prevent the dendritic graphite in the castings.[9]

Optimum effects on gray iron castings regarding soundness and mechanical properties are secured with mold pouring temperatures between 2600 and 2750 degrees Fahr.[9] Tests have shown that as much as 15,000 p.s.i. increase in strength can be secured with these high pouring temperatures accompanied by a marked decrease in losses due to *draws*, *shrinks*, and gassy metal. This temperature range is recommended even for heavy sectioned castings while even higher temperatures may be desirable for very light sections.

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Except for the softest types of iron (3.4 per cent total carbon—2.4 per cent Si or higher), no gray iron castings should be poured with metal that has begun to scum over or oxidize on the surface. The surface should be clear and bright. For most gray irons the temperature where surface scumming occurs is about 2580-2600 degrees Fahr.

The chill test is a convenient, inexpensive control of the microstructure, hardness, machinability, etc., of each ladle of iron before pouring. Each type of iron handled by the shop should have a particular depth of chill. Any small deviation from this desired chill capacity can be adjusted in the ladle before pouring. Chill formers, such as Mn, or Cr, can be added to raise the chill and chill reducers such as nickel can be added to decrease the chill. None of the above alloys will affect the structure or properties adversely when added in quantities just sufficient to bring the chill to the desired level.

Alloys In Furnace

Where possible, alloy additions should be made to the furnace. This practice prevents the undue cooling effect of the cold alloy addition to the ladle. Indeed, large ladle additions often lower the metal temperatures below that recommended for pouring and the advantage of the alloy addition may thus be offset by the cold pouring. Ladle additions therefore should be made with regard to maintaining proper metal temperatures. *Each 1 per cent ladle addition of cold metal lowers the molten metal temperature about 30 degrees Fahr.*

Due regard should also be given to uniformity of analysis. This is controlled easily with ladle additions to metal of definite weight. Variations in the weight of the metal collected in the ladle, however, mean just that much variation of the alloy content from ladle to ladle. For example, a desired 1000 pounds of metal may actually weigh 900 or 1100 pounds. This means that the ladle additions can vary ±10 per cent or a desired 1.00 per cent of alloy will vary from 0.91 to 1.11 per cent. A simple method to control the weight of metal in the ladle is by means of a steel bar hanging on the ladle rim to indicate the level to which the ladle should be filled for the desired weight. When tapping cupola melted iron two or more charges collected in the receiving ladle will tend to smooth out the variations in composition of the metals in the charge mixture.

Gray iron should be poured rapidly enough that the mold is filled with hot fluid metal before any of the metal has frozen. Here again, the soundness of the casting, the uniformity of structure, and the decrease of casting strains are improved with high speed pouring.

Hydrogen absorption is higher in electric and air furnace melting than in cupola melting. Hydrogen absorption, however, is best prevented by the methods discussed above under gases in metals. If hydrogen is known to be present it can be removed by the addition of small amounts of mill scale or iron ore, or less effectively by the addition of small amounts of solid metal at the time of tapping.

Light metal sections of malleable irons require the general practice of high temperature pouring of these irons. Higher pouring temperatures, furthermore, increase the chill capacity and eliminate the possibility of graphite precipitation. Pouring temperatures are from 2650 to 2850 degrees Fahr.

In order to secure these high pouring temperatures at the mold, requires high temperatures (2800-2950 degrees Fahr.) at the furnace to facilitate handling. Anything we do to increase the chill capacity gives greater assurance of white fractures and/or permits us to use more silicon in the metal, which in turn, permits shorter annealing cycles and therefore higher production, through the annealing furnaces and

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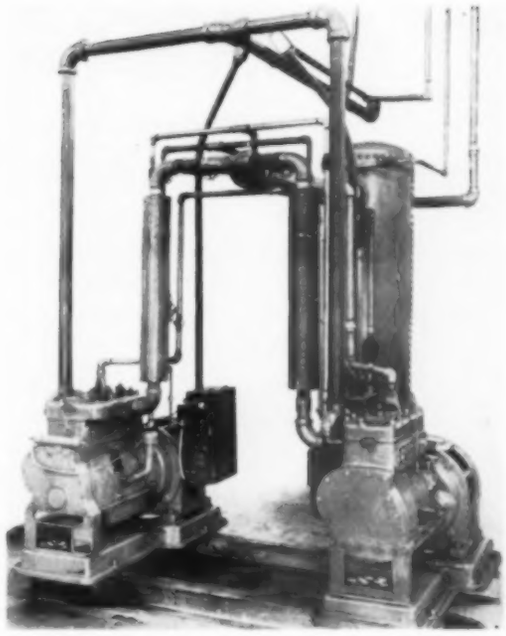

● The two Schramm Compressors shown here are installed in a Foundry where large volumes of air are required at certain periods in the production cycle. However, this maximum volume is demanded for only about 20% of the total production time.

Ability to supply air exactly as needed is achieved by using a unit system with automatic controls. This system permits the operation of one compressor only when air consumption is at a minimum. However, when demands for maximum air occur, the second compressor automatically cuts in and provides the additional air required until such time as demands fall off when the second compressor automatically cuts out, leaving only one unit to carry the load.

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the faster delivery of the castings.

Decreasing the carbon or silicon in the metal lowers the fluidity, while fluidity of the metal increases with cleanliness. In connection with furnace operation, over-reduced iron from an electric or air furnace or excessively oxidized iron tend toward decreased fluidity.[10]

Although the malleablizing problems of chilled irons in rolls and car wheels do not exist and the metal sections are heavy, the previous discussion holds for the chilled type of castings. As indicated above, for a particular depth of chill, or a constant chill capacity, it is important to keep the melting and pouring temperatures as well as the composition and furnace practice within close limits.

Copper alloys, like many other alloys, must be thoroughly deoxidized just before pouring. This can be done by using a suitable deoxidizer, such as phosphorus and zinc in amounts suitable to the furnace practice.

However, copper alloys tend to absorb considerable hydrogen. This hydrogen, which comes from the fuel or reduced water vapor, is often the cause of porosity. It can be removed from the metal just before tapping by adding 3½ ounces of copper oxide per 100 pounds of melt, followed by final deoxidation with phosphor-copper, silicon, or zinc. In the case of brasses and bronzes, then one must be on guard against over-reduction and oxidized metal.

The copper and aluminum-base alloys must not get too hot in the melting furnace or be poured at too high a temperature. Such practice causes large grains and undue segregation in the castings. Consequently, the melting temperature of nonferrous alloys should be no higher than necessary to satisfactorily run the castings. The following temperature ranges are recommended by various authorities for pouring sand molds:

Red brass .....2000-2100° F.[11]
Yellow brass ....1700-1950° F.[12]
Bronzes .....2100-2250° F.[13]
Leaded bronzes—
about .....1750-2300° F.[14]
Nickel bronze increase 30°
for each 1% Ni added[15]
Nickel silver .....2400° F.[16]
Aluminum alloys.1250-1300° F.[17]

When pouring into permanent metal molds the temperatures should be 75-100 degrees Fahr. hotter than when pouring into sand molds. Melting temperatures should be held to 100 degrees Fahr. above the pouring temperatures.[18]

Variations Affect Quality

To reduce the variations in the condition of the molten metal which affect the quality of the finished castings, the following points are pertinent:

(1) Hydrogen in molten metals can be held to a minimum by preventing its occurrence in the furnace and by keeping the metal on the oxidized side until ready to tap. Hydrogen may be removed by adding suitable oxides to the molten metal.

(2) When carbon monoxide occurs in iron and steel castings, it is a result of a reaction between iron oxide and carbon. Its presence, then, can be prevented largely by the removal of these iron oxides with calcium, silicon or aluminum just before or during tapping from the furnace.

(3) Some degasifying of the molten metal can be accomplished by adding small amounts of solid metal at the time of tapping. The amount of gas in the castings can be reduced by (a) melting at the lowest practical temperature, (b) hot metal pouring, and (c) careful placing of vent risers and of feed risers to have the last molten metal out in the risers.

(4) Clean metal well separated from slag is the best assurance of clean castings. Inclusions that are present, such as sulphides, should be in the least harmful form.

(5) With all metals it is desir-

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able to use a melting temperature which is not too high to cause excessive gas absorption in the molten metal or bad metal structure in the finished castings.

(6) The melting temperature must be high enough to allow for handling in the shop and supply metal of the proper temperature at the mold. Adequately high temperatures aid in metal fluidity and slagging off the impurities. High furnace tapping temperatures have little significance in producing quality castings, however, unless the proper mold pouring temperatures are maintained.

(7) Proper pouring temperatures reduce trapped gases and inclusions in the casting and result in improved physical properties of the metal. *Draws, shrinks,* surface defects, and excessive casting strains are common difficulties with too low pouring temperatures.

(8) The maximum convenient pouring speeds should be used for all castings. Too long a pouring time, is in effect, the same as a reduced pouring temperature. We should aim to have the mold filled with molten metal of uniform temperature before any freezing has begun.

It is worth our while, then, to give careful attention to the cleanliness, gas content, and metal temperatures so that only the best practice is used in preparing the molten metal for the castings to be made. That foundryman who accept the challenge to use the best practices and who applies these few important principles of metal preparation and handling finds his product more uniform and dependable, and therefore more in demand.

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Method of Pricing Malleable Iron

Producers of malleable iron castings and high alloy steel castings have been given price formulas by the OPA for establishing maximum prices for such castings as cannot be priced under Section 1499.2 of the General Maximum Price Regulation. Formulas are contained in Order No. 4 and 5 for malleable iron castings and high alloy steel castings, respectively, under Section 1499.3 (b) of the General Maximum Price Regulation, and became effective June 2, 1942. The formulas are the same as previously issued for gray iron castings.

They direct that the maximum price for any malleable iron casting of high alloy steel casting, which cannot be established under Section 1499.2 of the General Regulation shall be determined as follows:

"The producer's maximum price for each such casting shall be a net price (after adjustment for all applicable customary extra charges, discounts, or other allowances) not in excess of that at which he would have sold such a casting during March, 1942, under the pricing formula or method of calculating price used by him in March, 1942, employing the same cost factors (wage rates, prices of materials, and overhead) and profit margins which were in effect for him in March, 1942, even though his costs or profit margins may have increased since that date."

"Fluorescent Lighting Manual," by Charles L. Amick, Nela Park Engineering Department, General Electric Co., Cleveland, recently has been published. The manual makes available authoritative information on the construction and performance of all types of fluorescent lamps. It reveals the principles and methods of calculating illuminating requirements. It also includes pointers on how to install the lamps themselves, how to assure maximum light output, and how to locate and remedy trouble.

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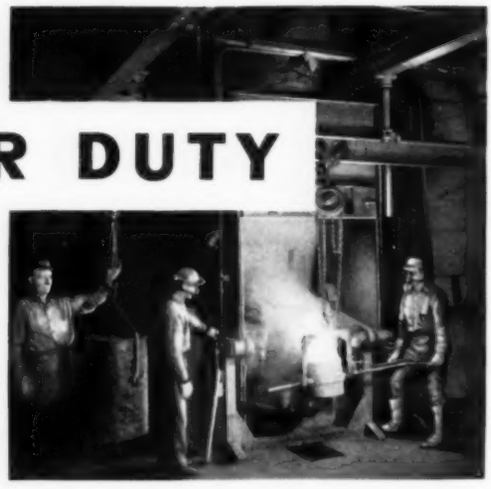

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NAVY MAKES NONFERROUS CASTINGS

(*Continued from page* 66)

possible and effective in the flaming inferno of war.

The roomy, well ventilated and exceptionally well lighted nonferrous foundry 122 x 200 feet is divided longitudinally into one center bay 52 feet in width and two side bays, each 35 feet wide. The core making department at the north end of the building is equipped with 3 large car type ovens 12 x 25 feet, two fired with oil and the third fired with gas, and 3 additional drawer type ovens in which small cores are dried. Part of the core room with oven cars in the foreground is shown in Fig. 5. The illustration also shows to some extent the wide range in sizes and shapes of cores. Figs. 2 and 6 will serve to convey some idea of the almost limitless range and highly intricate character of the castings produced. Under conditions photographs of large important castings made in this plant are not available for publication. However, foundrymen can draw inferences from the total melting capacity available per heat, approximately 10 tons, and from the fact that the main bay is spanned by two 25-ton capacity electric traveling cranes. Since each melting furnace can turn out four or five heats per day, it is apparent that the daily production of castings represents high tonnage and highly creditable performance on the available floor space. Under stress of war time emergency, work is carried on day and night by three 8-hour shifts.

Ample Furnace Capacity

Metal in practically every nonferrous composition is melted in 32 pit type natural draft furnaces and in three forced draft furnaces erected above the floor. Exceptional claims advanced for the three furnaces include simplicity, convenience, ease of operation and high melting capacity. Each furnace is equipped with a small fan operated by a cord plugged into a socket in the wall. Lifting the 300-pound pots does not present any problem, since the west bay in which all the furnaces are located, is spanned by two cranes, one 5-ton capacity and the other 7½-tons lifting capacity.

The pit type furnaces with covers level with the floor are arranged in two semicircular batteries with 16 furnaces to a battery as shown in Fig. 3. Flues from the furnaces in each battery radiate to a central

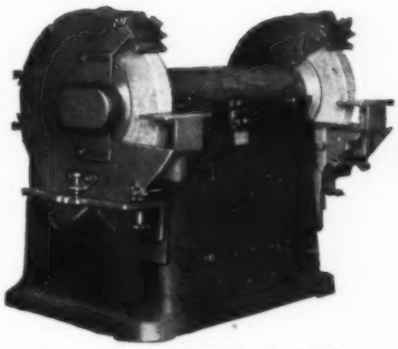
point where they connect with a stack 3 feet diameter and 75 feet in height outside the building. Conforming with present war time blackout restrictions, a closed chamber constructed around the top of each stack effectually prevents any visible glare while the furnaces are in operation. Fuel for all the melting furnaces is anthracite coal stored in a bin outside the building and forked as required through small arched openings in the back wall.

Heavy cast iron cover plates on the furnace are split through the center to prevent warpage or cracking and are provided with slides on top to facilitate movement of the lids, substantial frames filled with fire brick or other refractory material and readily moved backward or forward by the furnace tender. Ash pits in front of the furnaces are covered with cast iron perforated plates, as shown in the illustration. The plate 20 x 30 inches in front of each furnace is rectangular, while the narrow plate between each pair is narrow at the inner end and wider at the outer end to bring the entire assembly into conformity with the circular layout of the battery of furnaces. Gangways in the vicinity of the furnaces are paved with smaller sizes of the same general type iron plates. They also are laid on the floor of the machine molding section of the east bay of the foundry where it is claimed they greatly facilitate the work of preparing the sand in the maintenance of a clean, tidy, level floor.

Move Crucibles on Car

Crucibles filled with molten metal are carried from the furnaces to the center and east bay on a specially built low transfer car. In accordance with the safety program observed and practiced in all parts of the plant, the wheels are guarded with steel bands extending over the top and down on each side to a point close to the rails. This eliminates all danger of an inexperienced or careless workman getting his toes pinched under the wheels. Two narrow steel strips across the outer part of the band prevent any person from coming in contact with the face of the wheel. The band is held in place by two pieces of steel ¼ inch thick and 2 inches wide welded to the band and to the piece of channel steel forming the frame of the car. This clever device is shown in Fig. 4.

Crucibles in the center bay are handled by the crane either individually, or with the contents dumped into large ladles of the type used in iron foundries. Method of pouring, as in any foundry, depends not so much on the total weight of the castings, as in the



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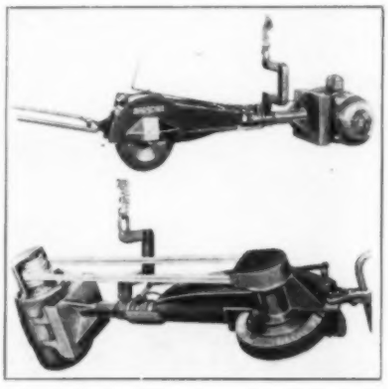

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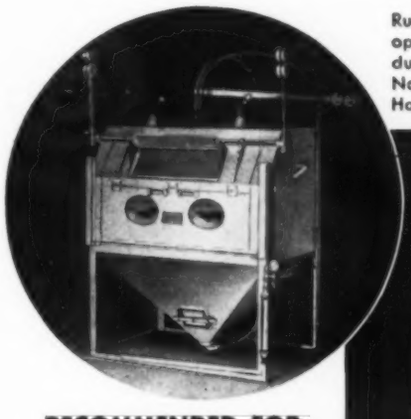

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total area. For example an internal ring gear, comparatively light in section and molded in a flask 12 feet square, is poured from four crucibles, one at each corner. The single sprue in each instance delivers the metal to a continuous runner encircling the mold cavity. Metal enters the mold through thin, flat gates spaced 3 inches apart.

In contrast to this, plain, simple and familiar style of gating, is method described some time ago by J. E. Crown, master mechanic for pouring the metal into a ribbed hydraulic cylinder 21 inches diameter, 10 feet in length, average metal thickness ⅜-inch and 2000 pounds in weight. The finished casting had to withstand a 300 pound per square inch pressure test. The casting was poured in a vertical position.

Reservoir Pouring Basin

A 3-inch diameter sprue at one side of the top was connected to a circular runner around the core print which delivered metal to the mold cavity through 24 vertical gates having a total volume of one and one half times the volume of the pouring sprue. A brick lined reservoir capable of holding the total amount of metal was connected to the sprue, closed with a graphite stopper to permit holding the metal until it was quiet and the proper temperature. Metal for this pressure tight casting contained copper 87.25 per cent, tin 9 per cent, zinc 3 per cent, nickel 1.75 per cent.

Following is a partial list of red bronze alloys successfully used for various types of castings designed to stand pressure: 88 per cent copper, 10 per cent tin and 2 per cent zinc, usually known as gun metal or Navy G; 88 per cent copper, 8 per cent tin and 4 per cent zinc; 87 per cent copper, 9 per cent tin, 3 per cent zinc and 1 per cent nickel; 85 per cent copper, 5 per cent tin, 5 per cent zinc and 5 per cent lead. This last metal known commercially as ounce metal, composition brass, red brass or eighty five, three fives, conforms to U. S. Navy specification 46 B 23 b.

Molds for light and medium weight castings in wide variety of shapes and sizes are made on the bench and on the floor in the west bay. The south half of this bay is equipped with four jolt ram roll-over molding machines. As pointed out elsewhere the naval foundries are jobbing shops where long, sustained runs of duplicate castings are the exception and not the rule. However, as in nearly all jobbing foundries a certain percentage of orders fall in the mass production class. Up to the present this molding machine equipped section of the foundry has been able to meet production schedules. The experimental move of paving the floor with cast iron plates has proved eminently satisfactory in facilitating the work and improving the general appearance. Molten metal is distributed to all the floors in the east bay from crucibles suspended from a monorail.

To attain maximum physical properties, many of the aluminum alloy castings are treated in two circular pit type furnaces. Castings are loaded on circular racks as shown in Fig. 6, made up of a heavy base, and a bottom, middle and top shelf. The shelves are 1-inch thick steel plates, separated and held together by pipe standards and bolts. A 3-inch steel shaft in the center is attached to the bottom and extends 3 feet above the top shelf and terminates in a shackle for attachment to the crane hook.

The compact heat treating and quenching assembly includes the two furnaces, a quenching tank in the floor between and a light jib crane with a rapid electric hoist. In practice, the loaded rack is lowered into the furnace where the castings are raised to a temperature of 960 degrees Fahr. and held for a period of 24 hours. The rack then is lifted and the castings are immersed in the quenching tank to a temperature of 180 degrees Fahr.

Loads Moved Rapidly

Furnaces and tank occupy space in the arc of a circle to eliminate any necessity of moving the hoist backward or forward on the crane jib. This facilitates rapid transfer of the castings from the furnace to the tank, without loss in temperature. Only a few seconds are required to attach the crane hook to the shackle on top of the central shaft, lift the load clear of the furnace, swing it over the top of the open tank and drop the load into the water. A panel of instruments on the wall back of the furnaces controls and keeps record of the temperatures in the heat treating cycle.

A building a short distance from the foundry is fitted up as a casting shop for ingots and slabs destined for rolling and stamping. Metal of various compositions is melted in a battery of pit type furnaces and in four 1000-pound capacity induction type electric furnaces. One of the furnaces with the molds mounted on a turntable in front, is shown in Fig. 1. Metal melted in this furnace is cartridge brass 70 per cent copper and 30 per cent zinc. The substantial cast iron mold, reinforced with ribs transversely and longitudinally on the outside, is in four parts, two sides and two ends, set up in a vertical position and held together by one piece rectangular steel clamps. The clamps are a loose fit and are held

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in proper position by wood wedges.

Each mold in turn comes under the spout of the furnace from which the metal flows directly into the open top of the mold. The furnace is tipped with a hand wheel and suitable gearing and pivots on trunnions in such a manner that the drop is practically vertical, instead of an arc as is customary with gear tipped ladles. Each of the side members of the mold carries a short tapered plug near the top end. These plugs leave a small indentation in the cast slab to serve as an anchor for the point of the tongs employed in removing the slab. This feature is shown in the illustration. An exhaust hood over the furnace removes the smoke generated while pouring this high zinc content metal.

Handling Castings In Cleaning Room

(*Concluded from page* 69)

operations also was a factor in bringing about better handling of small castings through the cooling, chipping, grinding, painting and drying operations.

In the cooling room, a low lift truck was replaced with a fork type truck, to permit castings to be stacked in special 2½ x 5 feet corrugated steel boxes, thereby leaving more room for cooling castings. After the castings are cooled, this truck also transports them in the same boxes to the loading platforms beside the tumbling barrels mounted on stands 6½ feet above the floor.

From the tumbling barrels the castings are discharged into chutes which carry them to the grinders and chippers who place them on a conveyor which carries them to the inspectors. After the castings are checked, they are placed on another conveyor which takes them through a paint dip and through a dryer oven.

With the old system, castings in boxes were transported by over head crane through all the foregoing operations. The new procedure saves time and space through constant flow by conveyor and the elimination of unnecessary handling.

After the castings are dried, they are removed from the conveyor, placed in 2½ x 5 feet corrugated steel boxes, transported by fork truck to the scales and then loaded on a trailer for shipment. Use of the truck on these operations has facilitated closer supervision, greater flexibility and more economy than was possible with former method. The tractor trailer system of transportation is used in the yard for handling a wide variety of miscellaneous material constantly in transit between departments.

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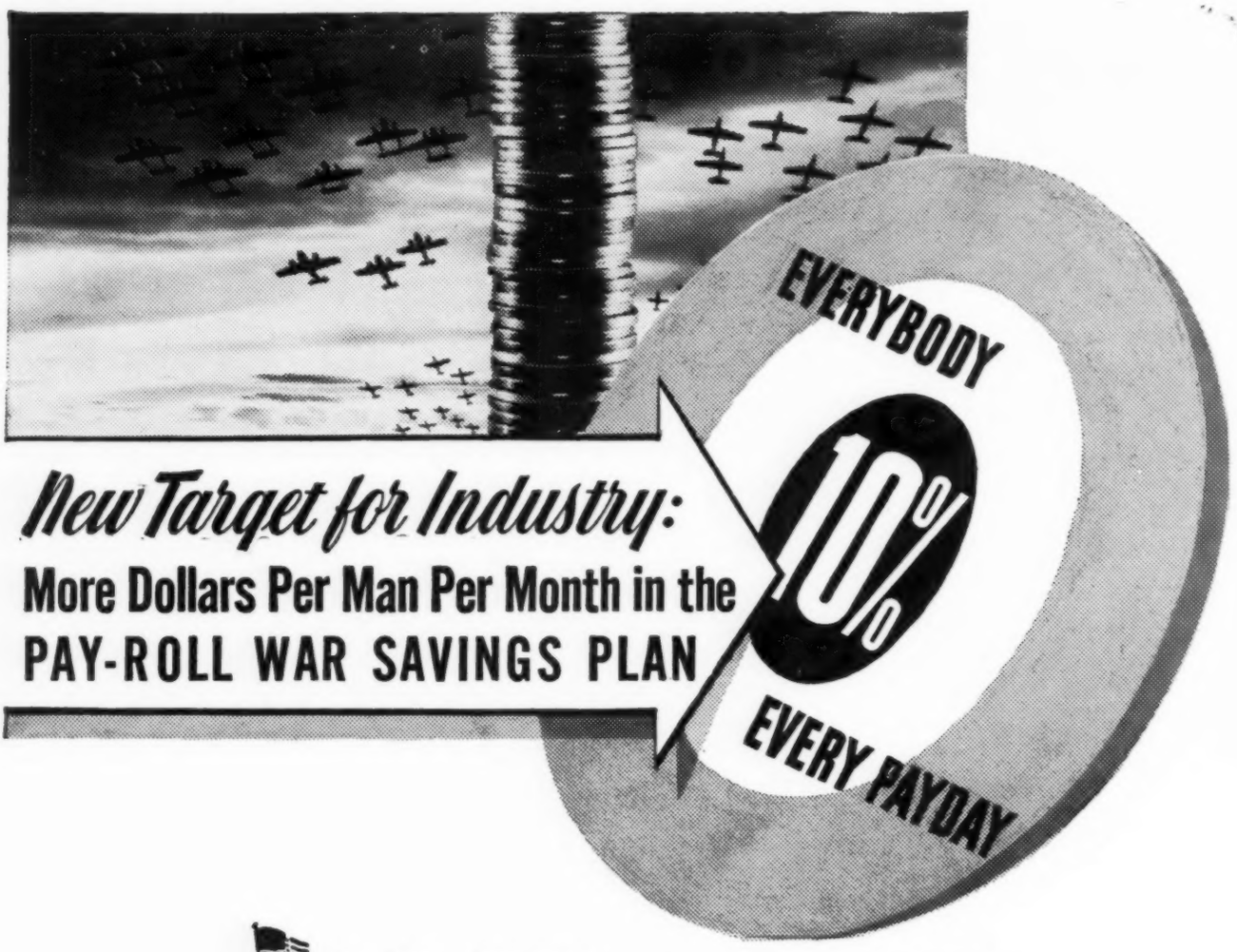

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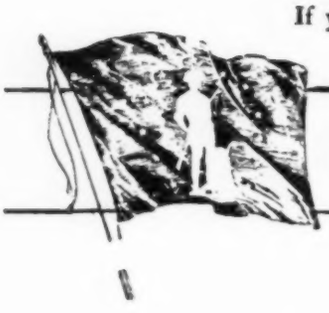

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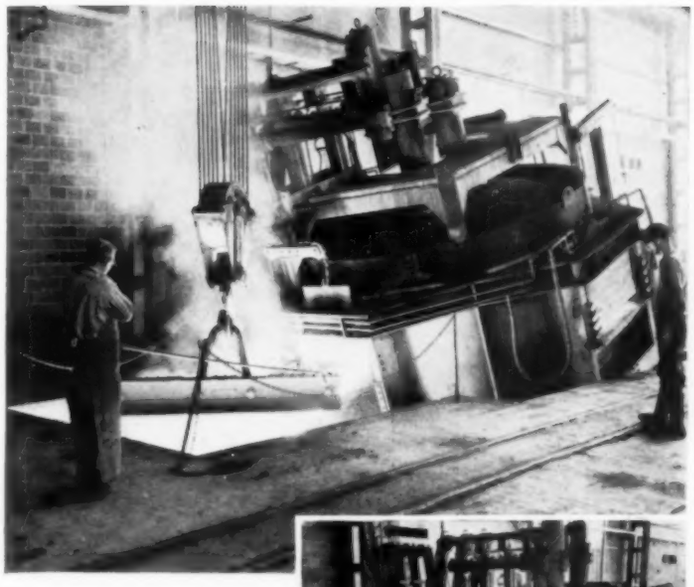

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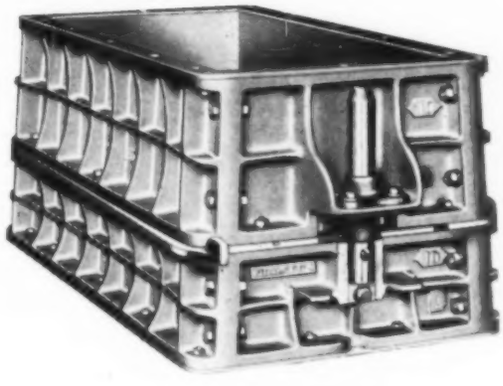

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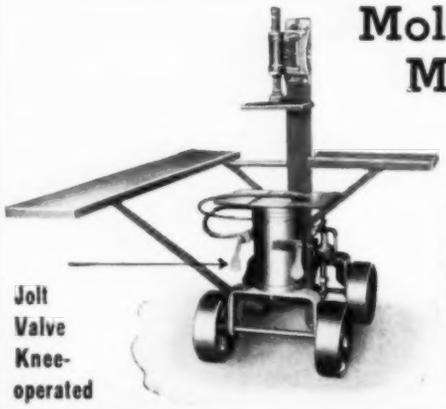

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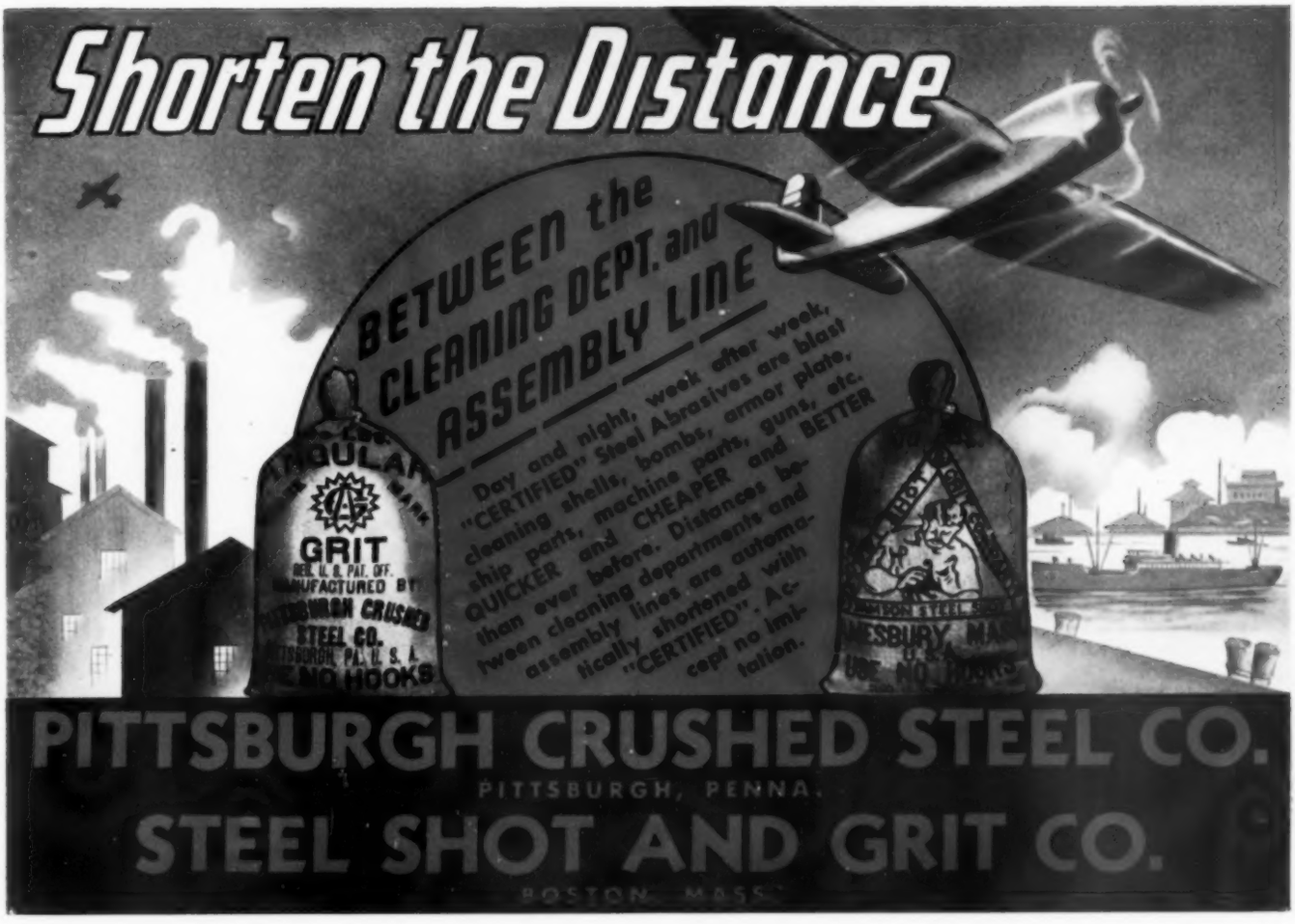
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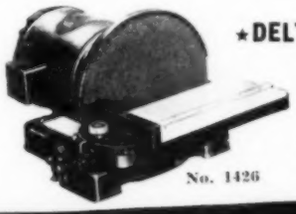

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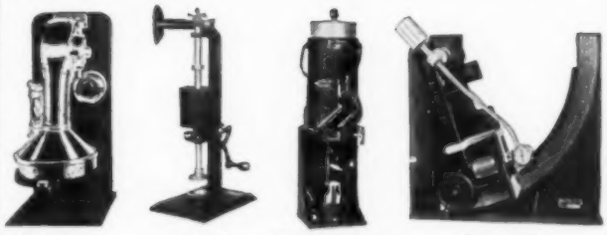

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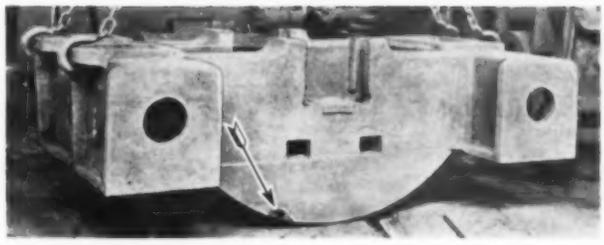

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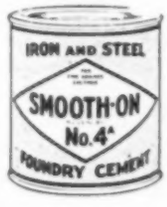

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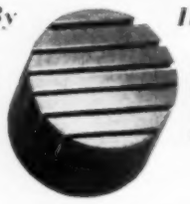
SMILLIE  VENTS

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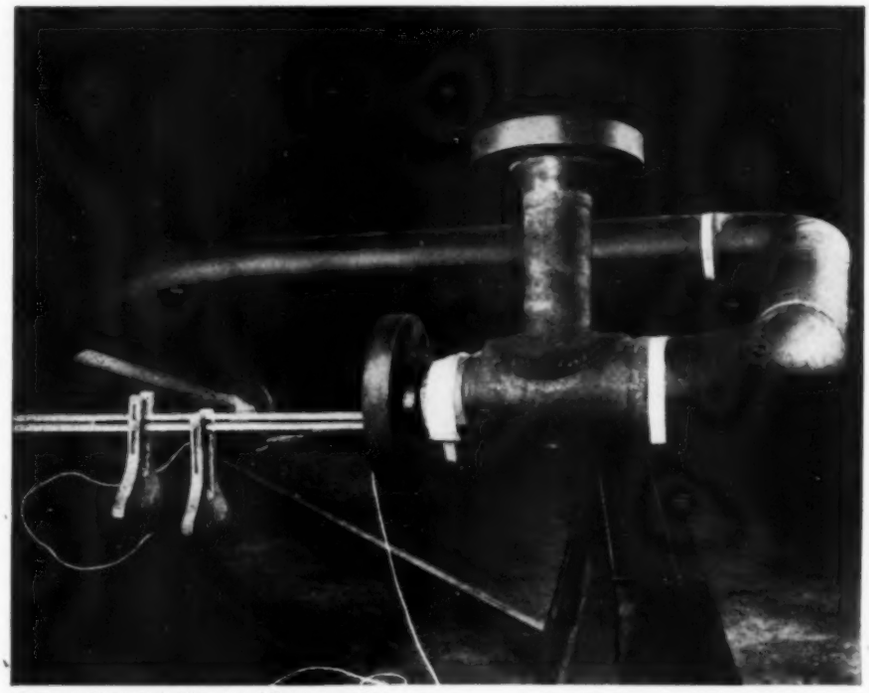

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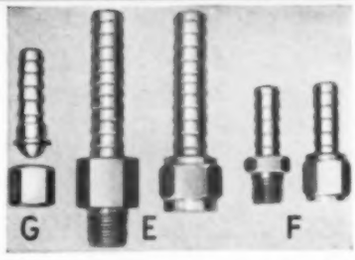

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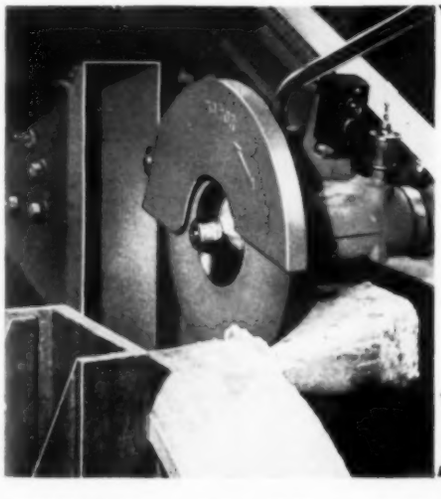

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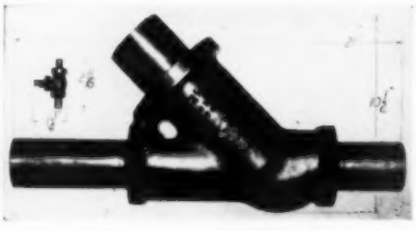

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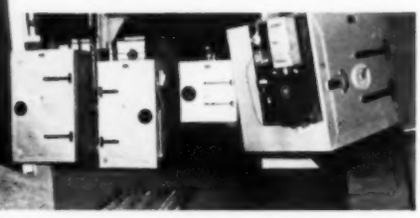

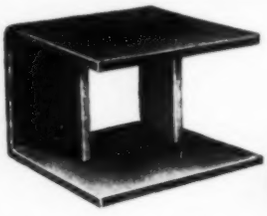

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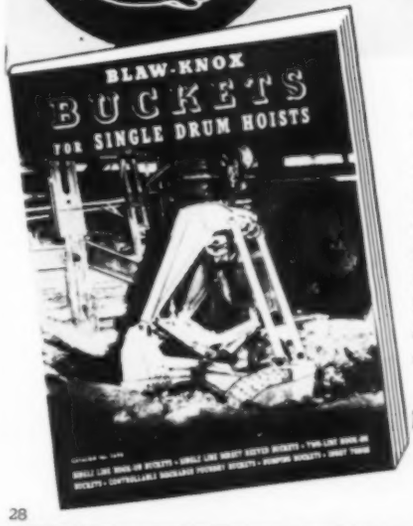

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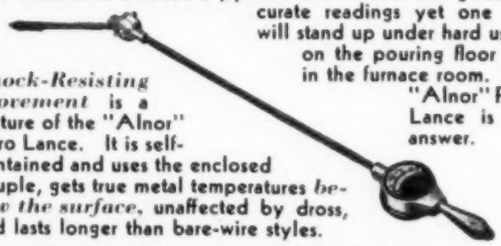

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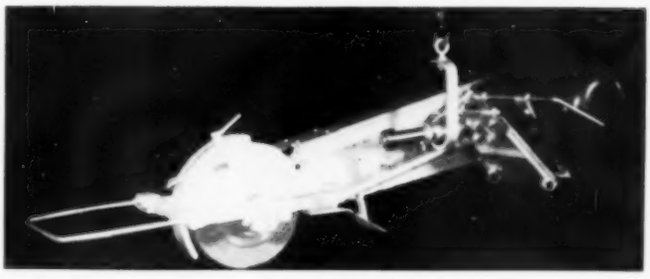

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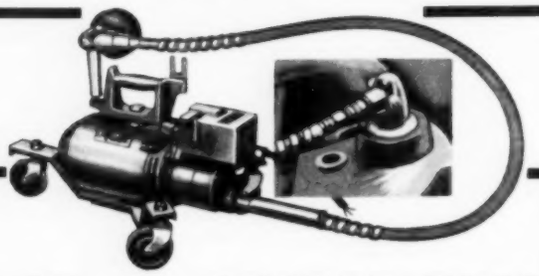

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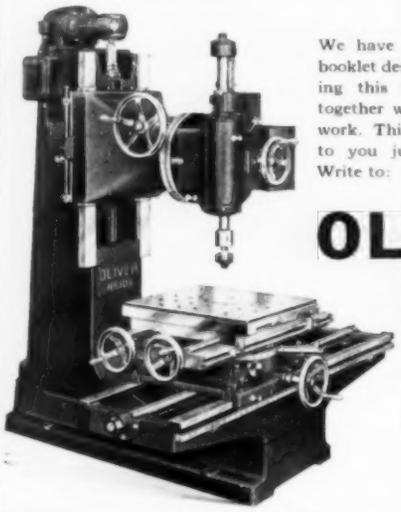

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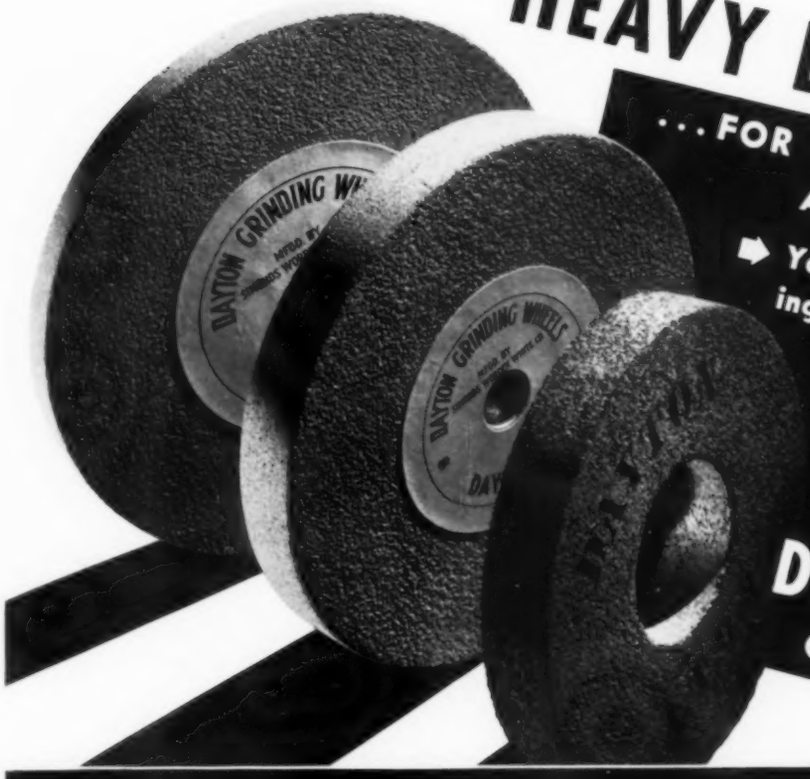

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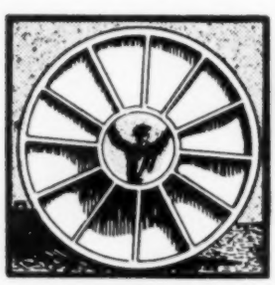

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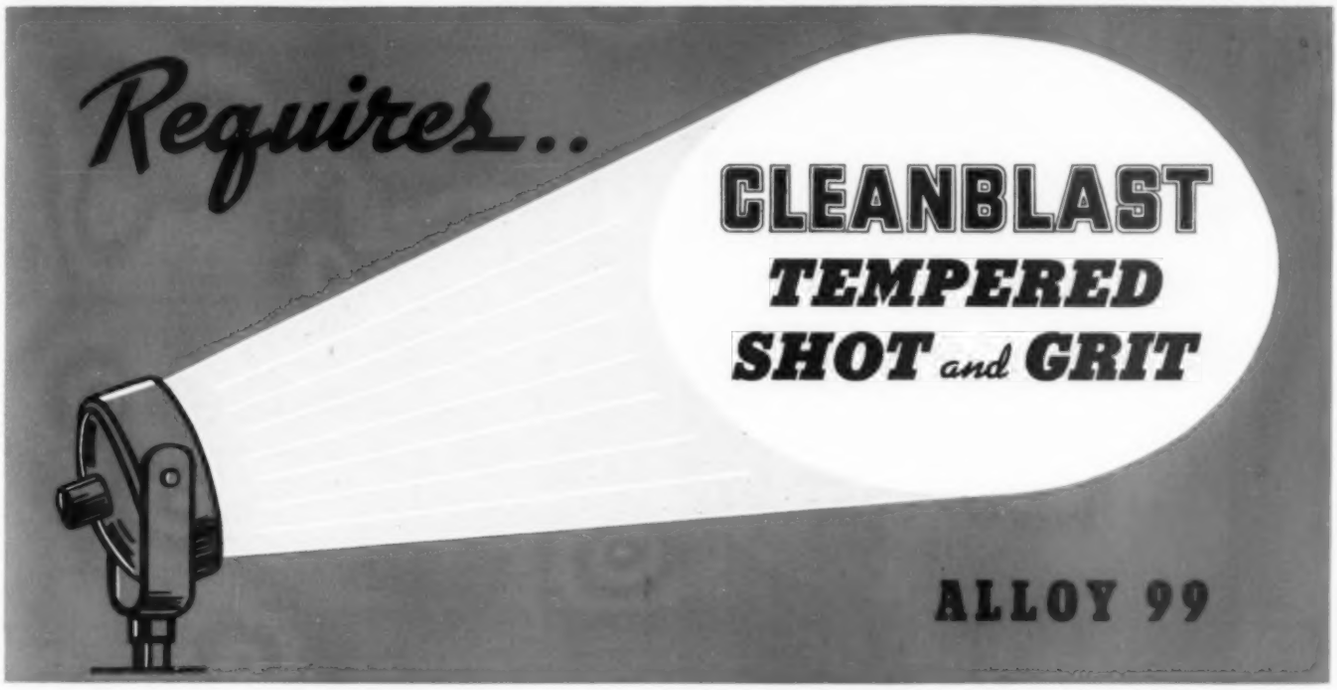

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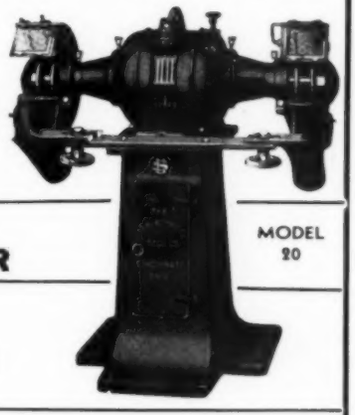

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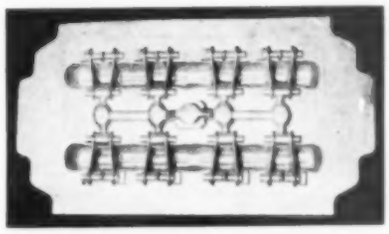

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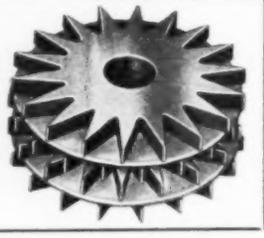

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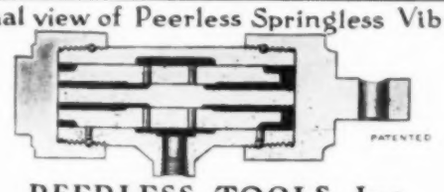

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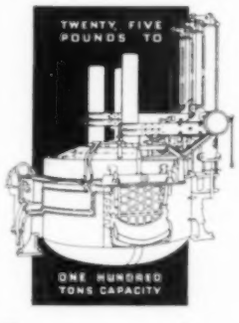

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Used Simpson Intensive Sand Mixers. State size, condition and lowest cash price for immediate acceptance. Address Box 578, The FOUNDRY, Cleveland.

Opportunity

PATTERN SHOP NORTHERN INDIANA

Sales $3000 month; new daylight type building 40 x 100; completely equipped; 25 man shop back log; industrial center; details. **Apple Company Brokers, 1836 Euclid Avenue, Cleveland, Ohio.**

Foundries For Sale

FOR SALE

Completely equipped foundry and stove factory on railroad siding, now in operation, located in mining town Northern Mexico. Owner wishes to retire to United States. For particulars write to **Mrs. Frances P. Low, Apartado Postal No. 3, Parral, Chih., Mexico.**

FOUNDRY FOR SALE

Gray iron foundry on main line of B. & M. R.R. with side track. Buildings in fair condition and sprinkled throughout. Plot area approximately 40,000 square feet.

GARDNER TRUST COMPANY
GARDNER, MASS.

For Sale

FOR SALE

One 24" flat belt Fox swing grinder.
One type AU-1 Pangborn pressure tank.
One 50-lb. Oxweld Acetylene generator.
One 15-ton Cleveland Crane sheave and block.
One No. 0 Whiting cupola. Address Box 673, The FOUNDRY, Cleveland.

FOR SALE

Seven coke type Walker-York crucible furnaces. Used two months. Excellent condition, reasonable price. Full details on request. **Schaible Foundry & Brass Works, 1090 Summer Street, Cincinnati, Ohio.**

FOR SALE

(1) 3-ton Heroult furnace complete except for controls and transformer.

(2) 1000 lb. Detroit rocking type electric furnace complete with 300 KVA 4600 volt transformer and panel board.

Address Box 671, The FOUNDRY, Cleveland.

For Sale

REBUILT COMPRESSORS AND BLOWERS

2800 CFM, @ 1 lb. North American Turbo Compressor with 20 H.P., 3600 RPM A.C. motor.

1250 CFM, @ 3¼ lbs., 3600 RPM Gen. Elec. with 30 H.P. A.C. motor drive.

(3) Buffalo Forge Pressure Blowers, 1200 cfm @ 11 oz., 9½" inlet, 7 x 7 outlet, driven by 7½ H.P. A.C. Motors.

450 CFM, 3500 RPM Gen. Elec. with 6.2 H.P. A.C. motor drive.

SAND VIBRATOR

Jeffery-Traylor, shaker type CVS-8, 6" wide hand deck, capacity 7 to 8 tons sand per hour; with 15 cycle, 110 volt, single phase vibrator motor generator set. Write, wire or phone.

The Motor Repair & Mfg. Co.
1552 Hamilton Ave. Cleveland, Ohio

AIR COMPRESSORS

BELTED—176 ft., 355 ft., 540 ft., 676 ft., 752 ft. & 1300 ft.

ELECTRIC—355 ft., 528 ft., 676 ft., 807 ft., 1392 ft., 1723 ft., 2022 ft., 2200 ft., 2800 ft., 3600 ft., & 5000 ft.

STEAM—368 ft., 500 ft., 800 ft., 1221 ft., 1640 ft., 2200 ft., & 3000 ft.

DIESEL—368 ft., 603 ft., 900 ft. & 1300 ft.

GASOLINE—110, 160, 220, 310, 1300 ft.

R. C. STANHOPE, INC.
60 East 42nd St. New York, N. Y.

REBUILT USED EQUIPMENT

Molding machines, all types; tumbling mills; furnaces; cupolas; air compressors; hoists; rammers, all types; ladles, all types; sand mixers; sand blast tanks; core machines, etc. All equipment rebuilt and guaranteed. All sizes used steel flasks.

HAYNES FOUNDRY EQUIPMENT COMPANY
1734 Lake St. Kalamazoo, Mich.

AUCTION — FOUNDRY

Land, Buildings, Machinery and Equipment of
DURBIN STEEL & MALLEABLE CASTINGS CORP.,
1016 East Columbia Street,
EVANSVILLE, INDIANA
SALE—TUESDAY, July 14, 1942 at 10:00 A.M. (C.W.T.)
On Premises at Plant

LAND: Approximately 9.26 acres, serviced by C. & E. I. Railroad Siding.
BUILDINGS: One story construction; brick, steel and frame; total area approximately 49,400 square feet.
MACHINERY AND EQUIPMENT: Includes large quantity of foundry Machinery and Equipment, Tools, Woodworking Machinery, Scrap Iron, Office Furniture and Equipment.
Detailed list of machinery and equipment will be mailed upon request.
Plant open for inspection daily 9:00 to 5:00 P.M.; watchman on premises.
Sale subject to confirmation.
TERMS OF SALE: Cash. Financing may be had, subject to acceptance and approval of the Owners, but limited to not more than 50% of the purchase price of the plant in its entirety, or on the land and buildings.
25% deposit required at time of sale.

Address all inquiries to
1608-9 N.B.C. Bldg. MAin 1861 Cleveland, Ohio

Classified Advertising

For Sale

FOR SALE

No. 22 Colliau cupola 3 ton capacity.

4 crane ladles capacity 1500 lb., 3000 lb., 10,000 lb., 16,000 lb. spur geared.

1 No. 6 Roots standard horizontal pressure blower.

24 x 42 reliable exhaust tumbling mill.

1—No. 2 Safety emery wheel stand.

1—No. 2 Cooper hand squeezer molding machine.

IRONTON PRODUCTS COMPANY
IRONTON, OHIO

FOR SALE

American Foundry sand cutter, Model HP. Cutting cylinder 24" diameter, 34" long. Motors, 60 cycle, 220 volts recently replaced. Reason for selling—replaced by larger machine. Mechanical O. K.

The Bignall Company
Medina, N. Y.

EQUIPMENT IN STOCK
GUARANTEED IMMEDIATE SHIPMENT
MOLDING MACHINES

(1)—No. 81 Osborn Jolt Squeeze Stripper Machine.
(1)—International Jarr Table 24" x 36".
(4)—Herman Jarr Table 40" x 60".
(4)—Herman Jarr Strippers Tables 40" x 60"
(6)—Herman Jarr Rollover Pattern Draw, Table 30" x 36", 40" x 55", 40" x 60".

MISCELLANEOUS ITEMS

(1)—Young Bros. Gas fired core oven, 12'6" deep, x 8' wide x 7'6" high, double doors one end, 4" insulation complete with burner, flues & pyrometer.
(1)—Coleman Junior No. 2 Core Oven 5-drawers, 42" wide, height 6" & 7".
(1)—1¾" cap. Shuster Power Sprue Cutter.
(4)—Large Flask Vibrators.

AIR COMPRESSORS & BLOWERS

(1)—12 x 12 Chicago N.S.B. 375-CFM. @ 100 lbs. with idler, unloader & lubricator.
(1)—2-stage Ing. Rand size 16 & 10½ x 12 cap. 770-CFM. @ 75-lbs. direct connected to a 125-HP. G.E. Syno. Motor, 2300/3/60-cy. exciter, control, after cooler & tank.
(1)—No. 4 Wil. Green Positive Pressure cap. 13-cu. ft. per rev.
(1)—Spencer Turbo Blower, 1300-CFM. @ 16-oz. 10-HP. motor, 220/3/60-cycle, 1760-RPM.

SAND HANDLING EQUIPMENT

(1)—Link Belt 24" x 55" hopper type Core Buster used with belt conveyor.
(1)—Link Belt Vibrating Screen 22½" x 50" used with belt conveyor shake out system.

MELTING EQUIPMENT

(3)—350 lbs. & 1000 lbs. Detroit Furnace complete with all Elec. Equipt. 2300 & 4600 volt transformer.
(2)—3500 lb. 6000 lb. Ladles, worm geared crane type bail (excellent condition).

ELECTRIC MONORAIL HOISTS

(30)—½ to 5-ton, 1 and 2-motor, Fl. & Cage operated, 220/440-volts, 3-PH. 60-Cy. 110 and 230-VDC.

OVERHEAD ELECTRIC TRAVELING CRANES

1 to 50-ton Cap. 18'0" to 91'0" span, 220/440-VAC. and 230-VDC. We operate the largest crane Rebuilding Plant in the country. Send us your specifications for Cranes, Electric Monorail Hoists, Crane Motors, Standard Motors, Steel Buildings and Runways. We can quote you on equipment rebuilt to your specifications.

T. B. MacCabe Co.
4300 Clarissa St. Philadelphia, Pa.

For Sale

Are **YOU** in need of foundry equipment?

Do **YOU** have equipment to sell?

Are **YOU** looking for experienced men?

Do **YOU** want to obtain a position?

If **"Yes"** is your answer to any of the above questions, may we offer the services of the Classified Advertising Department of The FOUNDRY? For rates write *today* to:

The FOUNDRY

Classified Advertising Department

Penton Building Cleveland

FOR SALE

One used No. 7 Roots-Connersville cupola blower in good operating condition. $1000.00 f.o.b. car Buffalo, N. Y. **C. S. Wood, 86 Dorchester Road, Buffalo, N. Y.**

REBUILT
BLOWERS—FANS—EXHAUSTERS

Roots-Connersville positive cupola blowers. Centrifugal blowers for gas and oil burning. Sand blast, grinder and dust exhausters. Ventilating fans.

GENERAL BLOWER COMPANY
406 N. Peoria St. Chicago, Illinois

FOR SALE

Cast iron floor plates, uncracked, in good condition. Available for immediate shipment, our plant Chicago, suitable for use around foundry.

HYMAN-MICHAELS COMPANY
122 S. Michigan Ave. Chicago, Illinois

For Sale

FOR SALE

5—175 lb. aluminum gas fired furnaces
1—Type "K"-84" American sand cutter, Buda motor
1—20" Davenport jolt stripper
2—16" x 5" draw hand rollovers
4—22" x 8" draw hand rollovers
1—24" International type "R" rollover
2—10" portable jolt squeezers
2—No. 112 Milwaukee jolt squeeze strip
3—No. 11-32 Nichols jolt squeeze strip
5—Arcade "Modern" squeezers
23—Hand strippers, round or square

CHAMPION FOUNDRY & MACHINE CO.
1314 West 21st St. Chicago, Ill.

FOR SALE

A complete blast outfit consisting of one No. 2 Slyblast Mill and one Ingersoll-Rand compressor and motor, all in good condition. Will sell as unit outfit or mill and compressor separately. Can be seen in operation by appointment.

THE AMERICAN CRUCIBLE PRODUCTS CO.
Lorain, Ohio

SPECIAL DEFENSE BARGAINS

American Sand Cutter machine Type H.P.
Air Receivers up to 36" dia.
60" Cupola stack sections only.
Air Compressor Unit—8½ x 12 Worthington Vee Belt drive with receiver, starter unloader etc. complete unit. 40 HP 3-60-220 motor.
Fans—Blowers—Exhausters for cooling, ventilation and dust or fumes removal. Multivane Fans in all st'd. makes and styles for large air volumes at low pressures.
Fan or **Centrifugal** style blowers—Maxon-Premix—from No. 1 to No. 6, Spencer Turbine, Am. Blower Co., Sturtevant, Buffalo, Clarage, Ilg etc. for Gas or Oil fuel Combustion.
Rotary Pressure Blowers — Roots-Connersville, Garden City, Green, Piqua, Sturtevant, Am. Gas Furnace Co. etc.
Furnaces for Brass and Aluminum Melting—Hausfeld Tilting open flame 400 lb. brass cap.; Booth Electric 725 lb. brass cap. with instruments. Stationary Furnaces, swing top for crucibles No. 6 to No. 150 and open top for iron pots up to 300 lb. aluminum.
Schwartz Furnaces—1—60" & 1—42".
Molding Machines—Osborn No. 404-S, Pit Type jolt-stripper. "Berkshire" 34" wide stationary air squeeze. "Tabor" 8" cyl. air squeeze. "Battenfeld" (Johnston & Jennings) stationary jolt squeeze; 5 in stock. Arcade—portable one in stock 8" cyl. Adams—Stationary hand squeezers 48" wide 2 in stock. Mumford—Stationary Air Squeeze 14 x 18" platen. Tabor—Hand operated, portable, Rollover, draw for 20 x 30" flasks or core boxes, 3 in stock. Nichols—10" x 32" Stationary.
1—Crane Ladle 4 tons capacity.
1—25 H.P. Diesel Engine, horizontal.
1—Whiting style, 36" x 60" Round Tumbling mill.
Sand Blasts—pressure generator tanks with hose & nozzles. Sly wet Cinder mill.
Sand Blast Barrel—New Haven 36 x 46" for Motor direct connected.
Sand Blast Table—Pangborn 8' d.a. with operators room and pressure generator tank.
Grinder Stands—Belt driven.
Combs Sand Riddle—1—type CS

Tell us your needs.

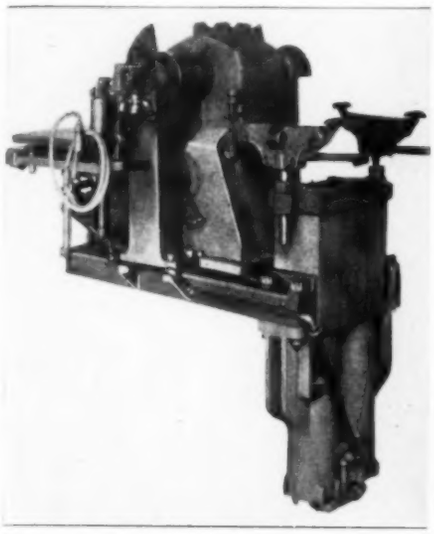
CLIFTON MACHINERY CO.
1023 W. 6th CINCINNATI, O.

"SCULLY-JONES" RECONDITIONED FOUNDRY EQUIPMENT

♦ Ready for immediate shipment, this equipment has been completely rebuilt in our modern machine shop. Prices on request.

INTERNATIONAL MOLDING MACHINES

1 49 x 16" draw Type "F," fitted with air equalizers, rollers in the draw section and hand operated core box clamps, jar plate 100" long, 6000 lbs. cap.



INTERNATIONAL TYPE "F"
(Enclosed Model)

48 x 16" draw Type "F"—4200 lbs. cap. @ 80 lbs., table size 48 x 83".
42 x 16" draw Type "F" (with double cylinders) 3400 lbs. cap. @ 80 lbs. pressure.
27 x 12" Type "F" International (enclosed cyl. type) 1400 lb. roll-over capacity @ 80 lbs. pressure, 22 x 34" table.

Herman INDEPENDENT TURN-OVER and PATTERN DRAWING DEVICE MACHINES

42 x 72" jar roll-over, 40 x 72" jolt table.
46 x 56" jar roll-over, 40 x 50" jolt table.
40 x 60"—15" dia. cyl. 9500 lbs. cap. @ 80 lbs. press., 42 x 60" jolt table.

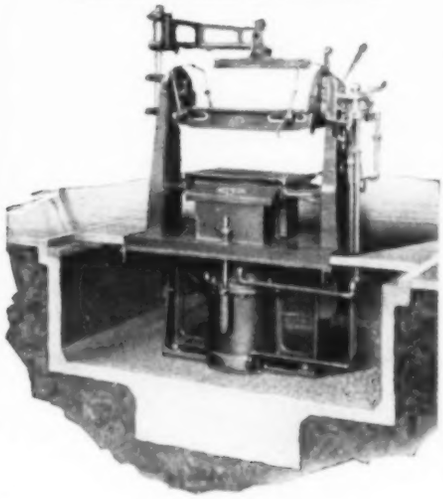
MILWAUKEE MOLDING MACHINES

Milwaukee No. 113 Jolt Squeeze Strip, portable, 500 lbs. cap. @ 80 lbs. press., 6" pattern draw, 16 x 26" table, jolt cyl. 5"—squeeze cyl. 11".
Milwaukee No. 113, same as above, excepting open end type, instead of closed end.

JOLT SQUEEZE & STRIP POWER

No. 142 Milwaukee, stationary, stripping cap. 1200 lbs. @ 80 lbs. press., draw 6" table 19 x 35"—open end type.
No. 152 Milwaukee, portable, max. pattern draw 6", pattern length 28" width 20", 1200 lbs. cap. @ 80 lbs. press., 22 x 30½" table.
No. 703-6 Osborn jolt squeeze and strip, 21 x 28" table, stationary, length of opening in lifting frame 34", 6" pattern draw, 8" cyl. dia. 1000 lbs. jolt. cap. @ 80 lbs. pressure, distance from lifting frame to squeeze head 24¼", flask length 44½", with roll off conveyor.
No. 703-5 Osborn, same as above excepting 17 x 35" table.

OSBORN Molding Machines



No. 332, jolt roll-over and squeeze with roller conveyor attachment, flask cap., max. length 36" width 26" pattern draw 9"—750 lbs. cap. @ 80 lbs.
No. 333, flask cap. max. length 45" width 32" —pattern draw 11", 1400 lbs. cap. @ 80 lbs. press. squeeze cyl. dia. 19".

No. 513-E Osborn Air Jolt and Electric Roll-Over, pattern draw and Run-Out Car, flask length O/A 124" width 72" capacity, width of roll-over table 60"—pattern draw 30"—cap. @ 80 lbs. pressure 12,000 lbs. with 15 HP Motor.

MISC. MOLDING MACHINES

No. 403-W Osborn jolt roll-over and pattern draw, flask cap. 52 x 36", 12" draw, with swing-out Mold Table, Power Roll-Over.
No. 24 Davenport jolt roll-over draw, stationary, table 24 x 38", 10" draw, 1000 lbs. cap. @ 80 lbs. press.
Tabor 24" hand ram, power roll-over and hand draw, portable, 20 x 30" table, 9" draw, 500 lbs. cap. @ 80 lbs.

SPENCER TURBO COMPRESSOR BLOWER

Spencer-Turbo-Comp. Blower, No. 1507, 675 CFPM @ 24 oz. pressure, 12" opening, direct connected to 7½ HP Westinghouse 3-60-220V AC 1750 RPM Motor.
Spencer-Turbo Comp. Blower, No. 1510, 900 CFPM @ 24 oz. pressure, 12" opening, direct connected to 10 HP Westinghouse 3-60-220V AC 1750 RPM Induction Motor.

BUCKETS

½ yd. P & H Single Line Grab Bucket, 1 yd. Brosius Single Line Grab Bucket.
1½ yd. 230V DC Elec. Bucket, cap. 8000 lbs.

CRUSHER

American Pulverizer Type S Mach 24—30 x 30" opening Crusher—direct connected to American Elec. 440V Motor.

B & P MOTIVE TYPE SANDSLINGER 3 ft. track gauge, ramming cap. 7-10 cu. ft.-11 ft. jib, 4 ft. ramming unit, ramming arm can be electrically raised or lowered, as desired, with Hopper—220V AC Motors.

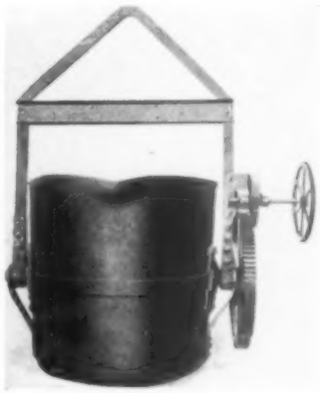
OVERHEAD ELECTRIC TRAVELING CRANES

35-ton Morgan approx. 35 ft. span Power House Type 4-motors, 600V DC Motors with Aux. Hoist, chain on main drum.
25-ton Walker 55 ft. span with 5-ton Aux. 550V DC Motors, girders single web const. truck ends with large steel wheels, chain on main drum, 3-motors.
5-ton Armington 26' 6" span, 2-motor type, 220V AC Motors, floor operated, 18" "I" Beams, trolley hand racked.
5-ton Shepard Class "B" 18'5" span, 1-motor, floor control, 6 HP 220V DC, trolley hand racked, bridge hand racked.
2-ton Detroit Ice House Type, 26 ft. span, "I" Beam Bridge Type Girders, 3-motors, 3/60/220V AC, floor oper. 10 ft. lift.

ELECTRIC HOISTS

1000 lb. Shepard equipped with 2HP 220V AC Motor, floor control.
1-ton Shepard Lift-A-Bout equipped with Trolley, 2¼ HP Zobell 110V DC Motor, floor oper., 18 ft. lift.
1-ton Shepard Lift-A-Bout equipped with Cleveland Electric Tramrail Trolley, 3 HP 220V AC, floor cont. 15 ft. lift.
1½-ton American Motor Driven Trolley, Motors 440V AC, floor operated.
2-ton American Engr Type NB-2, equipped with 2¾ HP DC Motor, 15 ft. lift, floor cont.
3-ton Detroit Top Hook, with Watson 5 HP 230V DC Motor, 12 ft. lift.
5-ton Detroit Top Hook, floor cont. with 6½ HP 230V DC Motor.
5-ton Northern Engr with hand geared Trolley, 4 HP 220V AC Motor, 20 ft. lift, speed 10 FPM, floor control.

LADLES



CRANE LADLES with "V" Bail
10-ton Whiting.
5-ton Whiting.
3-ton Whiting.

Dings inclinable BELT CONVEYOR 125V, speed 40-50, Type H, 3/60/220V AC, 10 ft. centers, 12 x 20" MAGNETIC PULLEY complete with FEED HOPPER and Speed Reducer.

Above items represent but a portion of our used or reconditioned FOUNDRY and INDUSTRIAL EQUIPMENT BARGAINS . . . Send for our current STOCK LIST No. 69 which shows COMPLETE STOCK on hand at our CHICAGO WAREHOUSE and advise as to your exact requirements.

SCULLY-JONES & COMPANY (Foundry Division) 2031 W. 74th ST.
PHONE PROSPECT 8770 — CHICAGO, ILLINOIS

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PARSONS

BLASTING THRU TO *Greater* PRODUCTION

PAR-BLAST *Cleaning Equipment*

One of the important "cogs" in our nation's remarkable production record is Par-Blast cleaning equipment, which is scientifically designed to combine speed, visibility and ruggedness.

Par-Blast Cleaning rooms are "Tailor Made" for your specific needs and their efficiency, dependability and speed cut costs to the bone and greatly increase production. Par-Blast Cleaning rooms are designed and built in all sizes and whether it's the Turntable, Car, or Monorail type you can depend on Parsons engineers, with over a quarter of a century's experience, to produce the best in design and the finest and most efficient in operation.

Operating equipment is located outside away from flying abrasive, with the control conveniently at the operator's finger tips in the room. Outside walls are heavy steel plate reinforced with structural iron. Inside walls are individual plates, doors self closing and self sealing. Downdraft ventilation, marine type lighting fixtures. Abrasive handling and reclaiming system is positive, delivering only clean, usable abrasive to the operator.

Write today for free literature on Par-Blast Cleaning equipment.

PARSONS *Engineering* CORP.

2545 EAST 79TH STREET • CLEVELAND, OHIO

Modern POURING FOR MORE PRODUCTION

V

Nothing is more necessary today for heavy war production than sturdy, dependable equipment. Modern pouring and melting equipment fills the bill and is doing a big job.

Call MODERN for your requirements.

MODERN EQUIPMENT COMPANY

Cupolas — Cupola Chargers — Covered & Insulated Ladles — Lifetime Geared Ladles — Improved Bottom Pour Ladles — Metal Pouring Systems — Crane & Monorail Systems For Metal & Mold Handling — Furnace Charging Cranes — Electric Mold Skin Driers

MODERN EQUIPMENT Co.

PORT WASHINGTON, WIS.

DEPT. 192

STAMPED STEEL LADLE BOWLS by Stevens

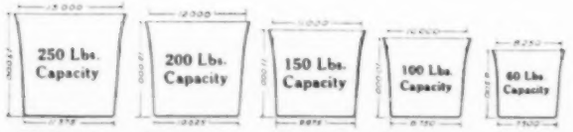
NO SEAMS
NO WELDS
NO RIVETS

Individuality is a characteristic of Stevens Stamped Steel Ladle Bowls. There are none like them—none can compare with them. They offer outstanding value. Note these advantages.

- Pressed from a single sheet of *special analysis*, extra heavy steel.
- No weak joints which may give way quickly.
- Uniform in size and shape.
- Cost no more than ordinary ladle bowls.

Use Stevens Stamped Steel Ladle Bowls. Thousands of repeat orders are mute testimony that they give complete satisfaction. Used in conjunction with Stevens Ladle Shanks, made with an extra strong cast steel band, a perfect fit is assured.

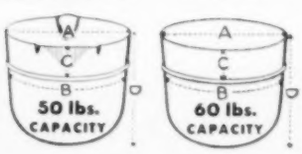
SPECIFICATIONS — PRICES



Made of 5 32" Steel	Made of 1 8" Steel	Made of 1 8" Steel	Made of 1 8" Steel	Made of No. 14 Gauge Steel
$4.25	$3.00	$2.50	$2.25	$1.35

f. o. b. Detroit or Nearest Branch

STYLE NO. 108 **STYLE S**



Round Bottom Bowls

Quantity production makes possible very attractive prices.

Style No. 108	Style S
A—8 3/4 INCHES	A—8 3/4 INCHES
B—8 3/4 INCHES	B—8 3/4 INCHES
C—1 3/4 INCHES	C—1 3/4 INCHES
D—6 INCHES	D—7 INCHES

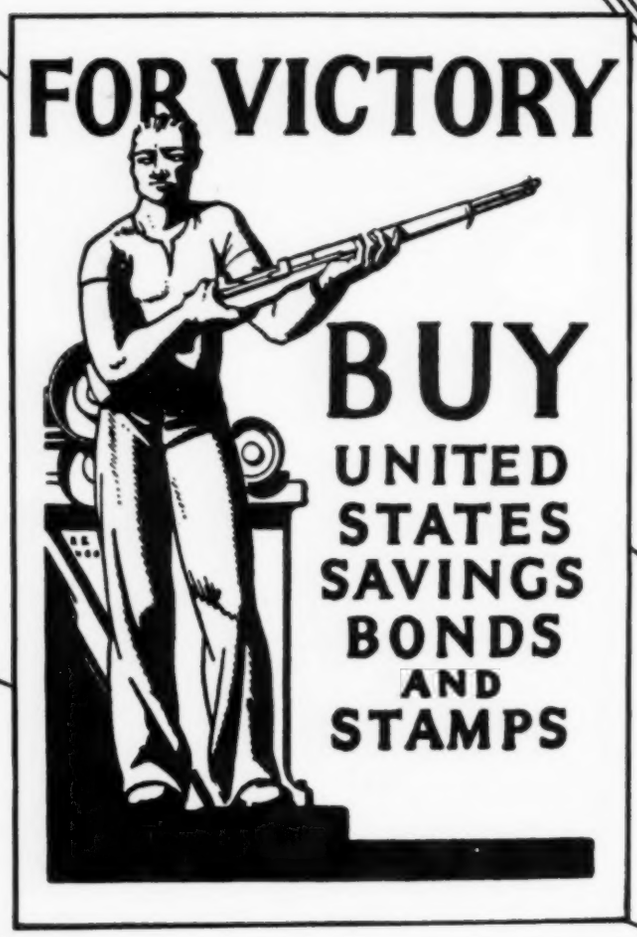
LADLE LINERS

Made of highest grade fire clay. Suitable for any metal. Made only to fit all sizes of Stevens Stamped Steel Ladle Bowls.

GEARED LADLES

See Stevens Catalog No. 25 for complete details on pouring equipment of all types—including Buggy Ladles, Trolley Ladles, Reservoir Ladles, Elongated Mixing Ladles.

"EVERYTHING FOR A FOUNDRY"



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VICTORY will be ours only as we the people back up our Government and our fighting forces throughout the world.

We—individually—can do our part by making further sacrifices—and one way that is most effective is to buy United States war bonds and stamps.

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